

Functional Specification for The Arabian
Adventures

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ABSTRACT

This document describes the human interface and message structures for "The Arabian Adventures" game proposed as the first game Packet Technologies should produce.

Revision History

<u>Revision</u>	<u>Date</u>	<u>Author</u>	<u>Comments</u>
0	22SEP84	Larry Summers	very rough draft
1	15OCT84	Larry Summers	scaled down, 2 teams
2	17DEC84	Larry Summers	new theme
3	20JAN85	Larry Summers	review changes

1. Introduction

This document will describe the Human Interface and message structures for The Arabian Adventures. The Arabian Adventures will be the first game produced by Packet Technologies Incorporated. A testing environment will also be described.

The Arabian Adventures is a graphics adventure game that will present a third person birds-eye view of rooms through which the user will move a graphic icon that will represent him. The user will be able to cause his icon to pick up objects in the room, drop them, and see what objects the icon is carrying. He will be able to pass between room to room, moving only in the 4 perpendicular compass directions (north, east, south and west). The user will be able to attack monsters and other users by causing his icon to collide with their icon. If the user has a full keyboard, he will also be able to talk. Many other features can and will be implemented, but these features are the central core.

The fantasy projected through the game will be from the Arabian Nights stories. The stories will not be strictly followed, so that anyone can play. There will be enough of the flavor of the stories to justify the name. Some artistic license will be taken in order to use familiar graphic icons and the common adventure game lexicon. The human interface should use graphics as much as possible, and text only when necessary. The most important thing to remember is that this is not just a simulation that uses the Arabian Night theme to define the shape of the icons. The interaction in the game should have the texture of the stories.

1.1. Purpose

Games are an essential service that Packet Technologies inc. should supply for increased revenues for itself and the cable operator. Games do exist on information providers, but will operate slowly because the data transactions will be massaged by many processes. The PacketCable system can provide very high quality games that will demonstrate the power of our system to provide the best in two-way services. These games will have to be written specifically for our system, either in-house or by contract.

The first game provided should also provide a testbed for gathering information for the design of future games. It should appeal to teenagers, and feel like a normal stand alone computer game. It should be graphics oriented and easy to learn.

1.2. Scope

The game should operate in two environments during different phases of its development. The first stage should be developed using the Sceptre Terminal and the Microtel terminal as dumb terminals connected to the Vax as a testing environment. The final stage will use the real hardware for testing. If the hardware is not available by the final stage, then development should continue using the dumb terminals.

The game will be developed in stages, each stage having a nested set of features. At the completion of each stage, the code shall be archived and tested. The definition of the features of each stage shall be completely defined before any coding is begun. The purpose of developing in stages is to have available a working version of the game to install and demonstrate at the earliest possible date. The features implemented in each stage shall be defined elsewhere in this document.

2. References

2.1. Background and Justification

PacketCable System Objectives
Subscriber System Requirements
Product Definition

2.2. Technical

Requirements for The Arabian Adventures
Videotex/Teletext Presentation Level Protocol Syntax
Headend Videotex Manager, Functional specification
CP Videotex Manager, Functional Specification
Timed Event Queue Process, Functional Specification
Timed Event Queue Process, Process Design Document
Tqadd, man page
Tqdel, man page
NAPLPS, man page
arc, man page
bitmap, man page
cOset, man page
color, man page
define, man page
domain, man page
field, man page
line, man page
point, man page
poly, man page
rect, man page
reset, man page
stamp, man page
text, man page
texture, man page
textcontrol, man page
vertex, man page

3. Environment

The first game is targeted to run in a System V Unix environment. It will use tqp for some timing functions. It will be connected to CPs by the Headend Videotex Manager (HVM). When users disconnect from the game, they will be handed to the HVM. It will talk to the CP Videotex Manager. It will not communicate with any downloaded application in the CP as part of the game (to be saved for future games).

It will build and send NAPLPS frames interactively to the connected CPs. It will communicate with the virtual NAPLPS terminal using record mode, so that upstream communication from the user will always be less than 40 bytes (one line of input only). It will be completely message driven, so there are no wasted cycles when no one is playing the game. Repeating messages from tqp will drive some artificially motivated elements in the game.

The game will be delivered in one configuration only

4. Compatibility

The game will be designed to run on System V Unix, written in the C compiler supplied with the system. It will use the standard input and output routines. The game will receive input from the full keyboard as well as the remote control.

5. Overview

5.1. Function

5.1.1. Installing the User in the Game

The User enters the game by browsing the menus offered by the HeadEnd Videotex Manager. The HVM should be designed to have slots in which games can be plugged in, so that the HVM does not have to be recompiled in order to install a new game. This will probably involve a text readable boot file for the HVM.

The HVM will send a Connect message to the game process when a user has selected to play the game. This will cause the game process to send the first NAPLPS frame to the user's CP along with the state information needed to establish the connection with the CP Videotex Manager (VM). Both the Connect Message and Disconnect message are to be defined by the HVM, as well as the format of the state information for the first downstream NAPLPS frame.

The first NAPLPS frame should identify that the user has indeed connected with the game by stating the name of the game. This frame should have some kind of artistic quality and acts as a cover to the game. An example of the flavor the cover could be:

A THOUSAND ADVENTURES ...
AND MORE ...

THE ARABIAN ADVENTURES

This title screen is based on the entry page of the Arabian Nights stories: A thousand nights and a night ... the Arabian Nights.

The game will download a character set to the user's CP while he is viewing this cover frame. To entertain the user while he waits, the border of the screen could be continually etched in the patterns familiar to Persian Rugs. Two other useful functions can be performed at this time: A hall of fame can be displayed, and the icons to be used in the game can be presented to the user with identifying labels for his review.

At this point, all messages coming from the user will be formed by the NAPLPS virtual terminal in the CP. The virtual terminal will display NAPLPS frames, receive user input from any unprotected fields in the NAPLPS frame, and send them to the CP Videotex Manager. The CP Videotex Manager will merely put an IPC header on the user input and send it to the game application in the HeadEnd.

The game will only support a finite number of users playing simultaneously. If all game connections are currently being used, newcomers will have to wait (or receive an error message). To make the wait more palatable, there should be a lobby which bears some resemblance to EARS. The lobby will remember who is in line to be next to play. When players leave the game, they will exit into the lobby. That will be the clue to the lobby to insert the next person in line into the game. It will also give users the ability to query the person exiting the game, to find out if he ran into a trap, etc., so they can avoid it.

The length of the queue in the lobby will determine how hard it is to play the game, so that the game connections are recycled more often.

Now the user is installed as a player. The new player is assigned an identifier. A NAPLPS frame indicating the assignment of the identifier is sent to the user. This acts as an acknowledgement that he is installed as well as informs him of how he will be represented in the game. It is called the Ack Frame.

In addition, all new player data pertaining to point-to-point addressing (and billing?) is recorded in the game database.

Alphabetic characters can be used to represent players rather than colored shapes because they are easier to recognize when there are a lot of unique moving symbols on the screen. The user should be represented by an icon that is immediately recognizable from all others. The icon that a user sees to represent himself should resemble the common mental image of Aladin (turban, sash, curled-pointed slippers). The rest of the players could be represented in the same icon with flatter colors, or as letters of the alphabet. Some experimentation will determine the scheme to be used. The biggest problem with using a graphic icons to represent human beings is the labeling of textual messages to indicate who sent the message and/or who to send the message to.

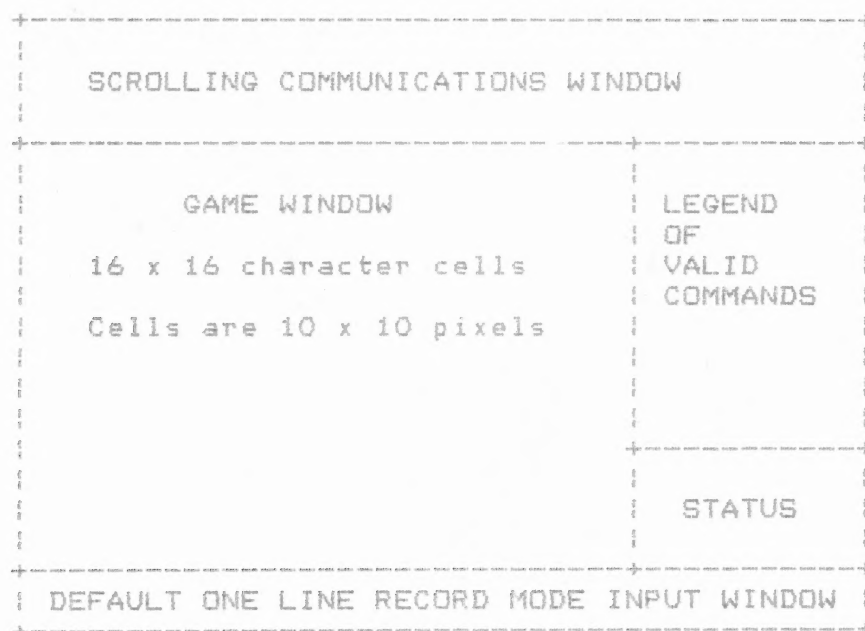
The Ack Frame also contains the list of highest scoring players of all time and perhaps a list of the highest scoring players this week. The maintenance of this lists is negligible, and will spawn greater interest in the game. Since there is no direct numerical score in an adventure game, the list could be billed as a hall of heroes in

chronological order. The game will provide ways for the users to obtain hero status. The number of heroes listed shall be small, and when the list is full, the oldest hero is taken off the list.

Statistics should be kept on the pattern of play. The game should keep a profile on disk of how many players are actively playing the game at any one time. Every time a player enters or leaves the game, an entry should be appended to the file. Of particular interest is the average number of players during the peak hours of play. Future games can be designed to support that number of players more conveniently. These game states can be stored as system events and retrieved from the journal. The data is bound to be numerous, and a private database can be provided, rather than clutter up the journal.

5.1.2. Screen Layout

The Display is cut into four windows:



There are only a few lines in the communications window. Afterall, this is not Ears.

The legend will change according to user state. The status will display system information to the user.

All game activity happens in the Game Window. Icons will move around a perpendicular grid of 16 by 16 character cells in the perpendicular directions. Icons are defined as a 10 by 10 bitmap.

The input window is the default record mode input line. This is supported automatically by NAPLPS if no unprotected fields are defined. It can only buffer 40 keystrokes, and must be at the bottom of the display.

5.1.3 Moving the cursor icon

The players command their agents to move using the numerical keypad. North is the 2 key. West is the 4 key. East is the 6 key. South is the 8 key. Players using a full keyboard can use the arrow keys. No diagonals are allowed because the full keyboard does not support diagonal arrow keys.

As the user enters numerical or arrow keys strokes, they are reflected in the input window. When the user depresses the ENTER key, the keystrokes are sent to the headend. When the message is received by the headend game process, the command string is appended to the list of current commands pending for that user.

The game will be designed so that users who enter multiple command key sequences will have a greater advantage over users who enter single character commands always. The multiple key command string will cause the player to move a little faster. (The polling loop with the headend game process will process commands faster than they can be delivered a character at a time.) Hopefully, This will lead players to enter in long sequences of commands, attempting to undo what they predict other players will do. Thus the players can evolve into a strategy play, and cut down message traffic.

In order to manage long character command strings better, two other keys are used. The zero key means to disregard all previously entered commands that are not yet implemented. The five key means "pause". The five key could be useful in creating unpredictable patterns of movement.

The pace of movement should be more deliberate, much slower than the average skill and action game. The slowness in responding to single character commands will act as incentive to use multiple character commands. The pace should be at most one movement per player per second and at least one movement per player every two seconds. The ideal pace would be if the user has enough time to decide and enter a four character command sequence just as a previous four character command sequence is finished being implemented.

If a player collides with a wall, his command is thrown away. The command list for that player is erased and the character stops moving. This is done so the user can get his bearings again.

If a player collides with another player, it is interpreted as an attack. Each player will have a variable that represents the strength of his character. Each time the user performs an action, his strength drops. The user's strength will increase if he performs no function

during a command polling loop. If a player is attacked, his strength is decreased. When his strength is zero, the user is deleted from the game. The user is informed of the status of his health in the status window. Rather than display a number, the user will see an adjective: excel, super, great, good, ok, fair, poor, bad, and gasp.

All input messages to the headend are processed first. When the input queue is empty, then the players are moved on the screen, a command at a time for each player. The order in which command lists are scanned is random for each polling loop of the command lists. This is done so that no player can predict that his character will implement his command before any other player.

Players which have the full keyboard can access the communications window. This will act as an inducement to get a full keyboard. If the user has a full keyboard, he can tell a pushy player to "Bite the Wall!"

The following feature is possible only if alphabetic characters are used to represent the users: Player A can talk to player B by typing "D: <text> [ENTER]". Player B will see "A: <text>" in his communications window. Player A can talk to players B, C and D by typing "BCD: <text> [ENTER]". Players B, C and D will all see "A: <text>" in his communications window. Player A can talk to all players by typing ": <text>".

If icons are used to represent players, perhaps there could be a screen that would associated alphabetic characters with user icons. This would give us the freedom to provide point to point communication if desired.

Some game elements will depend on how long the game has been played. The game will have a timer that will always be counting seconds as long as someone is playing the game. The game will have many timed elements sprinkled throughout.

5.2. Feature Sets

There are 8 levels of features:

- Minimal - a current demo demonstrates this feature set
- Monsters - Attacking, Yelling, Whispering, pretty rooms
- Minidrama - Caves, Ships, one room scenarios, pushing, riding
- Magic - Variety of magical objects
- Information - Weaving self help & user motivation into the game
- Background - Interaction between artificial agents in the game
- Drama - algorithmically created scenarios
- Roles - The users evolve in the game through role playing

Each feature set will be implemented in the order listed, nesting on the previous feature set. The first 4 levels of features will define a pretty good game. Each additional features set beyond these will bring it closer to a great game with a much longer lifetime.

5.2.1. Minimal Feature Set

5.2.1.1. Cover Frame and User Connections

The current demo encompasses most of the minimal feature set that is needed to actually have a game. There will be a minimal cover frame that tells the name of the game. It will support the connection of the maximum number of players (26). When a user leaves the game, his belongings will be deposited in the room where he last resided.

The user will see himself as a graphic icon that resembles the common mental image of Aladin. All moving icons are created using the DRCS feature of NAPLPS. DRCS characters are used because they are the fastest form of graphics delivered in NAPLPS save ASCII only. A DRCS character can only be printed in one color at a time. Users should be depicted with at least three colors because they are the objects of most interest and will be looked at most often. This can be done by placing three DRCS characters in the same character cell. Any other icon that desires to have more than one color must utilize one DRCS character per color.

A User can be shown the other users as icons that look like himself, but they must be easily differentiable from himself. They could be drawn using a flatter set of colors. There may not be enough colors to perform this trick. There are only 16 colors. All players should have the same base color for the face of Aladin (We don't want to design in prejudice based on color). Some colors can not be used for the color of Aladin's clothing because they are reserved as background colors for rooms: Nominal Black, Sand Dune Brown, Ocean Blue, and Dark

Brown. The color combinations chosen for the other players must seem less bright than the User's colors. All colors chosen must look good regardless of the background color of the room. With all these restrictions, it may not be possible to represent all players as human like icons.

There are only 96 DRCS characters. They should be used sparingly. The definition of the characters is a slow process and should be done only once at the beginning of the game. It is possible to redefine characters at different points of the game to attain more than the NAPLPS imposed limit of 96, but that should be saved as a last resort for game extension.

Players will be able to communicate with each other when they are in the same room. If the first character of a message is the ':' character, then the entire message is interpreted as a communication to other users. The text of the message will appear in the bottom row of the scrolling text window. The message will be labeled on the far left of the window, indicating who sent the message. The label will either be a letter of the alphabet, or an icon that looks similar to the graphic icon used by the agent who spoke. The game can use that as a pointing mechanism to talk about objects in the game, particularly users, by putting the icon in the middle of the message. Users may be allowed to insert icons in their messages using a macro, like "~" followed by a letter of the alphabet.

5.2.1.2. Rooms

The game will support 200 rooms when finished (if time permits). All 200 rooms will be created at the very first and stored on disk in one large file as records. At first, all rooms will be crude and practically featureless. The rooms will be designed more artistically in the next feature set. All connections and passage ways between rooms will be implemented. There will be a variety of different environments within the rooms.

Two hundred rooms may seem like a lot, especially if a small number of users will be playing at a time, and they will tend to cluster in groups. Nevertheless, a large number is needed because a graphics adventure is expected to appear infinite, so that users are attracted to replay the game and have a different experience each time. (We will be lucky if there is time to implement 200 rooms.)

In a standard graphics adventure, stepping off the east edge of a room will place the user on the west edge of a neighboring room. All geography in the game is expressed as different rooms. If neighboring rooms do not have a wall between them, it psychologically appears that the two rooms are actually part of a large plane, and that the user's

mental eye has just moved in order to continue viewing the graphics icon that represents him.

There will be two palaces, which will be identical except for color. Each palace will have a bazaar, taverns, a hall of audiences to meet with the Caliph, a treasury, an armory, etc. Each palace will be surrounded by a set of rooms which emulate a wall surrounding the palace, two of which provide a West gate and an East gate. There will also be windows in the palace walls, and secret passages.

The area surrounding the palace walls will be more densely populated with articles. As the user leaves the palace in any direction, the room features become more plain and identical, emulating the desert, and the ability to get lost in the desert. To help this fantasy, the connections between rooms could be dynamic in the central part of the desert where there are the least amount of features for the user to orient himself. The connections between rooms do not have to reflect real geometry. There could be impossible combinations connections created simply because it is a software pointer to a piece of data. (Leaving a room to the North could lead to the same room as leaving to the South.) Out in the heart of the desert, changing the connections between rooms will give the user the feeling that he is lost in the desert. As a design, we shouldn't disorient the user too much. The purpose is not to get the user lost and frustrate him. This feature is there simply to set the mood of the desert as a mysterious place.

The connections of rooms in the desert could change from time to time, but not very frequently. It will be referred to as the "shifting sands". The reconnecting of rooms should only happen when people are in the rooms affected. The users should be warned that this is happening. The sound of a strong wind would be excellent, but since NAPLPS provides very poor sound capability (beep!), the users will probably just see a message in the text window stating: "The sands have shifted".

There will also be a sea shore, to the east of which will reside islands whereon most of the adventures of Sindbad The Seaman will be portrayed as minidramas eventually. The palaces will be closer to the sea shore, but as far apart from each other as possible. In the Central Far West will be a mountainous area where rebel thieves reside. The distances between the mountains and the palaces should all be equidistant. The shifting sands will be in the center of the triangle transcribed by the two palaces and the mountains.

When a user enters the game, he will come out of a pond called "The Pool of Absolution". The room will have a pond in the middle of the room covering about one fourth of the room. At the center of the lower edge of the pool is a white square. No one can enter this room from the outside if he is carrying anything. No monsters can enter here. The pool will reside near the sea shore, half way between the

two palaces. There will be two secret passages, one to each of the palaces. If a user goes into one of the passages, he can not enter into the other one while he is still logged into the game.

In the north west corner of the world, there will be a mountain pass that a giant protects and does not let any real users pass. Through this pass come visiting dignitaries and perhaps foreign invaders. It will also act as a hook into a future version of the game. From the mountain pass will emerge the road to Sadir. This road will mark a path more or less diagonally across the desert, separating the north and south kingdoms.

The global map will wrap around from north to south. The west will be blocked by high mountains. The east will be an infinitely long ocean.

The map will have three nested levels that connect all of the rooms. For example, consider the palace: The palace will appear in one room as a shape that covers one fourth of the screen. It will have eight doors embedded in its outer perimeter that are clearly marked. These doors will lead to eight rooms that are connected as the outer perimeter of a three by three matrix of rooms. The eight rooms will look like a close up of the palace walls. There will be two doors leading into the inner palace from each of these eight outer rooms. The inner palace is actually a matrix of 5 by 5 rooms that do not wrap around on the edges. Note that there are 16 rooms on the outer perimeter of the 5 by 5 matrix, one for each door into the inner palace.

The nested levels of maps are helpful in allowing the user to get to where he wants to go with as few moves as possible. This was done so that the experienced player will not get too bored when he has to cover great distances.

The shifting sands are handled in this same way. The main difference is that the shifting sands top level entry points move around and seek out users to swallow up. If the shifting sands are getting close, the user will receive a message that reads: "The winds are blowing". As it gets closer, the message will be repeated with an additional adjective tacked onto the end, like "harder" or "very hard".

5.2.1.3. Objects

At first, there will be a static amount of objects in the game. The user will pick up objects by placing his icon over the object icon and depressing the letter "p" or a TS key and depressing the ENTER key. The object will disappear from underneath the user's icon, indicating that the user picked the object up.

To view the object while it is being carried, the user has to go into his inventory room by depressing "i" or a TS key followed by ENTER. The inventory room shall have all the user's possessions laid out in a matrix. A box outline cursor shall reside over one of the objects. The position of the cursor indicates what object the user has in his hand. The upper left hand cell of the matrix is always empty, and allows the user to place his hand on nothing. The user moves his hand over the matrix of objects using the normal arrow keys or a TS key followed by ENTER. The cursor is not allowed to land on a cell that does not contain an object, except for the upper left cell of the matrix.

The cursor may wrap around at matrix edges, to be determined by experimentation. The current thought is to allow the user to move his hand to a new object without entering the inventory room. A wrap around cursor for the hand will not allow a user to orient his hand without looking in the inventory room.

Some objects will obstruct the user's movement, so that walls and mazes can be built. This should be based on a comparison of an attribute, so that some objects can only be passed if the user is strong (climbing a hill) or if the user is not just walking (like riding a camel or a eagle).

5.2.1.4. TS Keys

Some of the TS keys may have game functions mapped onto them. The available keys are:

- LOCK - exit the game
- FAV - whisper
- NEXT - move the user's hand to the object to the right
- PREV (only on full) - move his hand to the left
- INDEX - go to the inventory room
- MORE - pick the object up
- BACK - drop the object
- HELP - (could be special help screen or woven into game)
- ORDER - Yell
- REPLY - talk

One may wonder why the ability to talk should be given to the TS user. They can only utter numbers. Nevertheless, this can add to the game as a subculture. It can be thought of as a foreign language, or the babbling of idiots. An entire dialect based on numbers could evolve. We should consider it as a valid possibility.

The HELP key could actually cause the game to give the user an advantage, depending on how long he has been playing the game and how much

he is carrying. Depressing the help key could make it easier for the user to stumble onto a valuable object or weapon. This key may also be considered a prayer when the user is being attacked by monsters, and could cause something to come to his rescue.

5.2.1.5. Monsters

In this feature set, there will only be one kind of enemy: the lion. They will travel in prides and not leave the room they are assigned. They will remain in the desert for the most part. Their movements will be no faster than the user's, and they will not be very intelligent. They only need to hit a player one or two times to cause death.

5.2.2. Monster Feature set

5.2.2.1. Cover Frame

The Cover Frame will be made complete, with all the bells and whistles.

5.2.2.2. Rooms

All rooms will be made to look nice and artistic. Room backgrounds will be constructed with the Mosaic feature of NAPLPS.

Normally, this isn't done until all the rest of the game is finished, because the process of refining the depiction of the rooms could go on forever. It will be done at this time for the purpose of having a ready demonstration during development.

5.2.2.3. Attacking

Until now, the collision of the user with another object only resulted in one of two states, the user was allowed to move into the character cell or he was not. Now, if the user is not allowed to enter the character cell, the object residing in that cell may be affected. The effect will be determined by what kind of object it is, how strong the user is, and what the user is holding in his hand.

If the user is holding a weapon in his hand, he is attacking the object. As a result of the attack, the user also loses strength. If the user's hand is empty (the inventory room cursor is on an empty matrix position), then the user is attempting to push the object. Pushing will not be implemented until the next feature set.

Users will be attacked by monsters and will need to attack to protect themselves. Or they may want to kill a beast, after which they can pick it up, and exchange it at the bazaar for money. Or they can simply kill and rob each other. If a user succeeds in killing a fellow player, all the objects that player was carrying are spilled onto the sand, and the dead user disappears out of the game.

5.2.2.4. Yelling and Whispering

If the user ends a communication with an exclamation point, it is

interpreted as a Yell. A yell is sent to all players in the same room, as well as all players in the neighboring 4 rooms if any. It is also sent to any monsters in those rooms.

If the user surrounds the text of his message with parentheses, then the message is only sent to players that are in the same room and are within one of the 8 neighboring cells of his icon. The parentheses represent a side comment. They symbolize speaking through cupped hands into another's ear.

This feature allows private conversations. It was designed to allow more than two to talk in private. In reality, there is a probability attached to the distance between players that determines if the conversation was overheard by another player in another room. If the distance is 1 or 2 steps away, the message is always heard. But if the user is 4 or 5 steps away, there is a lower chance. This will allow the game to lead the user along, by allowing him to stumble onto a conversation in a tavern between two game controlled actors. In later features of the game, role playing will affect overhearing whispering. Wazirs (Wizards) always hear whispers because they are magic. Thieves have keener ears and have a higher probability of overhearing.

The affect of whispering does not only have to apply to the receipt of messages. If a user is far from the speaker, perhaps the message will be garbled a little, like replacing letters with blanks so it is harder to decipher.

5.2.2.5. Hiding and Looking

If a user types "h", that means he is attempting to hide. It will cause his icon to disappear on the screen, and whatever else may have been at that location. If the hidden one remains motionless, no one will know he is there. Of course, he will have to enter the room by himself first.

To oppose that feature, the "l" key means "look closer". It will cause anything that is hidden close by to be redrawn on the screen. In later feature sets, some roles will be better at hiding than others. (a random filter will determine if a look command will reveal the hidden user). Other roles will be better "lookers". (There range of view as well as intensity of view will be higher.)

5.2.2.6. Guards and Palace Gates

The palace will be issued guards that wander around it and police it

and sometimes go on patrols into the desert. Any user can be in the palace courtyard, and in the hall of audiences, but if the user is in any other place, they will come after the offenders. If the user is holding a weapon when they catch up to him, prepare for a fight to the death. If the user is not holding a weapon once they get in a neighboring cell, they will drag him off to the Caliph who will sentence him. The user might get off, he might be jailed, or he could be sentenced to death, depending on where he was first seen by a guard and how well the Caliph enjoyed his dinner.

In human interface terms, the user is not actually forced to watch his icon be physically moved to the hall of audiences where the Caliph is. The screen is just redrawn as if the user appeared at the entry way of the hall of audiences, and then the user's icon is let loose, but the doors are locked. If the user is sentenced to jail, there are secret ways out, but only the rebels know how. The jail is close to a window on the palace wall, so yelling can attract attention. If the user breaks through the window, he may escape. The guards may hear and follow immediately, or they may discover later, but they will eventually pursue the criminals. The window is repaired as soon as it is known that it is broken.

Note that they do not take the user's goods, only his weapons. The user could try to bribe the Caliph, which may make him feel better or worse, depending on where he was when caught. Offering him money when the user was near his treasury or Harem is not advised. Attacking the Caliph is not advised, either. Doing so could cause a war, particularly if the user succeeded in killing the Caliph.

The palace gates close once a day during the prime time hours for about 45 minutes, maybe more. During this time, the rebels have more of a free reign over the desert, because there are no patrols. The rebels sweep down from the mountains and steal things, and do other unclean activities.

During this period, intriguing things happen in the bazaars, etc. Part of the intrigue is trying to sneak into the palace from the outside.

5.2.2.7. Lions, Eagles and etc.

The lions will be beefed up a little more in this feature set. They will still stick together in prides of 2 or 3. They will be able to move from room to room, but will still remain in the desert. They will randomly wander from room to room in search of users to eat. They will smell users in neighboring rooms and will hasten to them. There is a random factor that they may not smell the user. They

immediately respond to yelling. Their speed will be determined by how hungry they are. Real lions eat once a week. These lions will, too. The function of their speed will depend on how long ago they made their last kill. They won't even wander to a new room for two days after a kill. Lions will roar when they are hungry. The roar will appear in the communications window. The frequency of roaring will indicate how hungry they are. When they are dangerously hungry, their roaring will be yelling, so that users can hear them in neighboring rooms.

Eagles will remain close to the mountains. Eagles are solitary creatures. They rarely bother people, unless the user gets too close to their nests. If the user takes something of theirs, they will relentlessly pursue him. Rebels require users to get an eagle's feather to be a member of the inner clan (The Simsim).

Vultures will fly over the deserts in groups of 3 or 4. They will not attack unless the user's strength is less than FAIR. Then the chance of attack will be rare. As the user's strength decreases, the possibility of attack increases. This could snowball, so be careful, and rest alot in their presence.

5.2.3. Minidrama Feature Set

Objects should be endowed with properties. They should be able to be broken when attacked, or pushed out of the way. User's should be able to hide their objects in caves when they leave the game, so they can keep them safe until they return. In addition, simple traps should be set up to give the flavor of the stories. These short scenarios will probably resemble puzzles more than anything else, but will give some advantage to users who have read the stories.

5.2.3.1. Objects and Caves

The whole system of objects should be dynamic. When the game first begins, there should be weapons and jewels placed here and there in the game. Automated merchants should allow the trading of gems for weapons. In reality, the merchants are game processes that destroy the gems and generate weapons in their stead. As more and more users obtain objects and hide them away, More objects will have to be created for the incidental player so he can pick a few things up and get started. (The game should recognize that he doesn't have much, and place an object in his way so he can stumble on it.)

To keep experienced players on their toes, weapons could be susceptible to deterioration. Every time a cimitar is used to hit something, it will deteriorate a little more. Objects, if attacked, will deteriorate more rapidly. Doors can be broken down. (Broken doors are fixed by wandering slaves who act as janitors of the game.) Some objects can be pushed. The type of object determines how much strength is needed to push it. Only one object can be pushed at a time.

Caves will be implemented to allow user's to store their belongings between periods of play. Caves are special purpose rooms that are not stored on disk like regular rooms. The only thing recorded on disk about a cave is what real room it is connected to, and what objects are inside. A cave looks like a black featureless room. There is only one entrance at the center of the screen on the top row (to give the illusion of descending into the cave). Only one person can be in a cave at a time. Caves can be locked with a magic word. The magic word must be 4 ascii characters. Upon leaving the cave, the user must say a four letter word, or the door won't open. That will be the keyword to let the user back in. When the user enters a cave, the objects within it are randomly strewn all over. Exiting a cave and then re-entering it immediately will show the objects inside in completely different positions.

The first time a cave is entered, the secret word is 0000. A

numerical word will allow TS users to have caves. It is feasible to only allow Full Keyboard owners to access caves, in the which case the default secret word should be more artistic, like "ALLA". A four character length was chosen for convenience only. The key word should not be very long. Making the keyword dynamic in length raises all kinds of issues that probably aren't worth the effort. The user can say a word as long as he wants, but only the first 4 characters are significant.

There is a problem that a user can go around a lock all the caves before anyone gets a chance to use them, if he knows where they are. To avoid this, it should be made harder to do. So, every cave password must be unique. Any user that wants to monopolize a lot of caves must have a real good memory. What this means is, if a user is in his cave and says a four letter word that will not open the door, he knows it has been used. This will allow him to open that other user's cave, if he can find it. Happy Hunting!

Each time a cave is entered, it's usage counter is reset to zero. Once a day, all cave usage counters are incremented. If a usage counter ever reaches 7, then the password is reset to the default password. This is done to recycle the caves if a player gets bored and doesn't play anymore. Note that the belongings are still there for the lucky user who stumbles on them. This was implemented to force a serious user to play at least once a week. If a user plays every night, he might become a hero and have even greater disk access privileges. (See Drama Feature Set)

5.2.3.2. Keys, Locks and Doors

There should also be locks and keys in the game. The user can only pickup a lock if it is not on a door, or if it is unlocked. The user can lock a door by placing his hand on a lock, stepping on the door, and then dropping the lock. The user will not go through the door if his hand is holding a lock. There are two sides to every door, but the lock is only accessible from the side where it was placed. Hence, a door can have two locks on it, one on either side.

To open a door that is locked, step on the door, and drop the key to the lock. If the key worked, there will be a open lock laying on the door. The key will remain in the user's hand regardless.

To not use up lots of characters defining different types of locks, there are locks of different colors, and keys of different colors. If a key has the same colors as a lock, it will open it. Note that there may be many keys and locks all of which are of the same colors.

5.2.3.3. Riding Camels, horses, and other things

If the user steps on something and types "r" followed by ENTER, it means he has attempted to ride something. There are camels, horses, eagles and even magic carpets to ride. If the user attempts to ride something illogical, he has wasted a move. To dismount, use "r" again. Attempting to ride a female icon will result in a scream, and being labeled a vile criminal fit only to live with the rebels. There are ways to redeem ones honor, but death is easier. (If a hero attempts this, he will be stripped of his title. For hero, see Drama Feature Set.)

While riding a horse, camel, or eagle, the user can move greater distances in less time. Horses move three times as fast as walking when near the sea shore. Horses go twice as fast in the desert. Camels go three times as fast in the desert, but only twice as fast at the sea shore. Eagles go three times as fast wherever they are. Horses and camels both go three times as fast as walking when on the road to Sadir.

Camels and horses can be bought in the bazaars. Camels can only be bought in the southern palace. Horses can only be bought in the northern palace. The Animal Sales are held continually just within both of the palace gates. Only one Camel is sold at a time, with a specific price attached to it. At first the price is high, but as time goes by, the price goes down, to bottom out at a base price. Dropping the right price in the bowl next to the camel will purchase it. Don't mount a camel that you haven't paid for, or you'll be accused of stealing.

This is the only section of the bazaar that animals are allowed in. If animals are found in any other room of the bazaar, they will be killed. Appropriate signs will be posted. The owners of these camels will be fined or jailed, depending on the mood of the Caliph.

5.2.3.4. Friday Night Fights

All week long, users will see pamphlets scattered throughout the game announcing the Friday Night Animal Fight. The fight will take place in either the North or South Palace (50% chance). The fight will always take place in the same room off the side of the bazaar. No one will be able to enter the room until the fight begins. The room will have a large cage in the middle of the room. In the cage will be placed to predetermined animals. (The animals were determined at the end of the fight last week. The pamphlets say what kind of animals are being pitted against each other.)

The purpose of the friday night fight is four fold. First, it adds character to the game because it will foster a sense of Adventurous fantasy in the players. Second, it will be away to earn wealth through betting (To be described). Third, it provides a place for frequent players to come and meet newcomers who will be attracted here by the pamphlets. Fourth, it fosters competition because heroes of the opposing kingdom will have to come here to "play".

The fight itself will be more like Wrestling on TV. It will be obviously fake. The animals will squawk alot when they are hurt. The fight will go through various shifts of which animal has the advantage. It will take about 20 minutes for one of them to win. Game agents will holler in the background, to give the feeling that this is a bunch of ruffians, and it is OK to "act tough".

The mechanics of betting are simple. All users bet against the house. There are two posters at the top of the room, at the west and east edge of the room. Under each poster is a bowl. Dropping a jewel in the bowl will place a betting ticket in the user's inventory. The betting ticket will have a number on it of how much has been bet. The odds are double or nothing. When the fight is over, cash in your ticket by dropping it on the bowl. A jewel of the right amount will appear in the inventory to replace the ticket. Dropping additional jewels simply increase the amount of the ticket. It is OK to bet on each animal. The tickets are colored in the colors of the two palaces, to help cause a bias between them. You can bet all the way up until the end of the fight. That way, as one of the animals is about to lose, a lot of betting may take place (like a feeding frenzy)! But be careful, the apparent loser might all of a sudden gain his strength back and the fight will go on (A ploy to get people to bet more).

As a trick, a user can keep his betting tickets if he bet on an animal who lost. The ticket will be good at next week's fight. The game will never say so, but the color of the ticket that lost one week will always win the next week, so that users will be able to get rich if they are smart. This will never be advertized. I'm hoping they will discover it and think they are cheating the game. I'm also hoping it causes greater attendance at the fights.

The Caliph will attend the fights once in a while. If he does, the odds go up three to one. The taverns will spread rumors that the Caliph may attend the fight on the previous Wednesday and Thursday.

When the fight is over, users are expected to hang around and talk. But after awhile, the caretaker will announce that they are closing. If you don't leave within 5 minutes, you'll be sent back to HVM.

5.2.3.5. Islands of Sindbad the Seaman

In order to have islands, there must be an ocean and ships. Ships are docked at the sea shore. The user rides a ship just like he would ride a camel or horse. Ships don't move any faster than walking, but only ships can go in the water. If the user enters the water without a ship, he will be at the mercy of the tides.

Trying to use cursor movement commands will influence the current of the tide (swimming), but the user does not have direct control over his movement. Swimming does take more strength than walking, so the user will tire more rapidly. The user will appear to be going under the water and then will reappear at a nearby location in the water. The user could be brought back to the sea shore safely, but he might also be deposited on an island. He could also be eaten by a Sea Serpent. The user will tire less rapidly if he is carrying less, but everything he drops is lost forever.

If the user is riding something, and lands in the ocean, the object he was riding will sink, unless it was a flying object or a camel. If user is riding a camel and commands him to step in water, the camel will not move and the user will fall off into the water.

The center of the ocean will have dynamically connected rooms like the shifting sands in the middle of the desert. When the ocean rooms connections are changed, the user will see a text message that reads: "The tides have changed". This will happen infrequently (about once every 1 or 2 minutes). The "changing tides" are an inner set of rooms that are arranged in a three by three matrix.

There is an island where there is a great white dome. The possibility of reaching this island safely without sinking is 33%. The dome is actually a giant egg. The mother of the egg comes and goes occasionally. If the egg is damaged, she will kill all users on the island. If there is a ship nearby, she may sink it, too. If she succeeds, the user will float helplessly until a current carries him to another island. If the egg is not damaged when the mother bird arrives, she will not notice the users and will roost on the egg. Users can then crawl on her. If a user crawls on her and waits for two polling loops, she will fly him to the jeweled island. There is no other way to get to the jeweled island. All ships headed for the jeweled island will crash and sink.

On the jeweled island, the eagle will drop the user off in a room where the user is trapped on the bottom half of the screen, called the valley of the snakes. There are numerous jewels everywhere. There are also large snakes. Eagles occasionally attack the snakes, but will leave the user alone. The snakes attack rarely, and never in

groups. The only way to get out is to ride the red pieces of meat that are thrown down once in a while (around every 5 minutes). An eagle will swoop down and grab the piece of meat. If the user is riding it, he will escape. He will be carried to yet another room where the bird will land and then be chased away by merchants. If the user does not give the merchants sufficient pay for saving him, they will throw him back down into the valley of the snakes. Near the merchant is a room where there is a boat that will take the user where he wants to go.

If The user guides his ship to the island of the apes, an army of apes will tear the ship apart and steal everything the user has. There is a giant black savage on this island that eats human flesh. He will capture users and take them to his hut. There will be other captives already there. These captives will talk of secrets of the game that the user can learn nowhere else, such as where to find the Jinni of the Lamp. The Savage will eat a captive every once in awhile. Real users that are being held prisoner will always be saved last for dessert. The Savage leaves after every meal. While he is gone, the user may find a hidden ship that will take him to safety. As soon as a user boards the ship, the savage will come to the island sea shore and throw rocks at the ship. If he hits the ship, it will sink and the users will float helplessly to another island.

Other islands include:

- A jeweled island where the only way out is an underground stream.
- The island with the palace of the 40 doors,
behind one is a winged stallion.
- An island which if you land on it becomes a large fish
you must get back to your boat before it goes under.
- An island that has a harem which call to you to come
as you get nearer, the current draws your ship closer
to a sea monster that guards the island

5.2.3.6. Other Short Dramas

Each palace has an east gate room and a west gate room. This is where users should park their camels and horses. If you take your steed into the palace, the guards will arrest you and kill your animal. If you resist, they will do you in, too. After being arrested, you are tried by the Caliph. You may be fined, jailed, or set free with a warning. In each gate room, there is one camel placed that belongs to the game. This is called the Tease Camel. The Tease Camel indicates that this is the parking lot for camels, but also has a dramatic purpose. If a user mounts a camel in a room, without first dismounting from a camel in that room, it means he is stealing the camel. Users may attempt to steal this camel. When someone steals a camel, he is declared a criminal, and his picture appears in a poster in the Hall

of Affairs in the palace. Whoever kills this thief will receive a nice reward.

The user steps into a room and is met with a beautiful princess. She draws closer. The user enters her inner chamber, whereupon the doors to the inner chamber close. A Jinni is revealed lying motionless in the corner of the inner chamber. The girl demands the user give her a ring else she will wake up the Jinni. If the user doesn't have a ring, something wealthy may suffice. Else, its rumble-tumble with the Jinni, but not right away. The user has a little while. Attacking the Jinni while he sleeps will weaken the Jinni, but will also awaken him. Attacking the girl will immediately awaken the Jinni. Attacking the door has a random chance of awakening him. (50/50 that the door will open before he awakens)

The user steps into a tavern. After a short while, the owner of the tavern comes nearer. When he is 4 steps away, he pauses and says: We don't like strangers here. All of a sudden, all the other patrons start to move away from them, leaving the user and the tavern keeper alone. Then the tavern owner starts to move in, and the crowd starts to mumble and make bets. The user could have avoided all this by giving a gift to the owner when he first came in the place. Or perhaps the user could have made a show of force by coming into the place with a weapon in his hand. Or when the tavern owner calls you out, start advancing on the owner quickly, which may cause his confidence to fade, and he will back down and apologize. (This scene is more algorithmic than deterministic. Other statements that the tavern owner could make is: We don't allow your kind, OR You are a thief!)

There is a need for short dramas that require a group. After all, this is a multiplayer game. The traditional way is to provide rooms where there are just too many monsters for one person to handle, or different types of monsters that need different things to kill them, and they happen to attack at the same time. We will provide that, but we can be a little more creative than that also. A simple way that has never been used is to make a long adventure at the end of which is a room that can only be opened from the outside. The room contains lots of treasure, but the user needs to bring a friend to hold the door open.

5.2.4. Magic Feature Set

When this feature set is completed, this will be a reasonably complete game. It will have all the elements of an adventure and enough polish to project an Arabian Nights fantasy. The additional feature sets will add more dramatical interchange for the users, but are not absolutely essential for game play.

5.2.4.1. The Pool of Ablution

This is the pool where all users enter the game. The pool has other magic properties. When one stands on the short, white pier overlooking the pool, a vision will be revealed in its reflection. The user will see a temporary view of the entire game. He will see the location of all other players in the game as little white dots on the map. The vision of the pool is not dynamic, the white dots won't move. The user will see the vision for as long as he is standing on the pier.

This is necessary for the new players so they can find out where the current players all and go where the action is, without having to get lost or bored.

5.2.4.2. Crystal Balls and Other Information Spells

There is an option in the inventory room legend for "rub". Rubbing the white crystal ball will reveal a short vision of the entire game. The entire map of the game is displayed. White dots indicate where users are. Black dots indicate where rebels are. Red dots indicate where some monsters are.

There is a red crystal ball that when rubbed will randomly show a room where another user is. It will never show the same room twice in a row. The vision is temporary.

There is a yellow crystal ball that when rubbed will randomly show everything another user is carrying. The user must be in the same room with possessor of yellow crystal. It will not show the same user twice in a row. The vision is temporary.

There are a number of sea shells that will allow anyone who possesses it to hear what any other person is saying, as long as they have the same kind of article. This is something like a walkie talkie. But the user doesn't turn it on by rubbing it. It is always on, and can't be turned off. This can get quite irritable, especially when anything said in the user's room will appear in the communications window

twice.

5.2.4.3. Magic Carpet

The magic carpet will move the user to a neighboring room with one command. The cursor position the user will land at will be as close as possible to the cursor position he had in the last room. But moving one step at a time is not possible until the user dismounts the carpet.

5.2.4.4. Ring of Invisibility

When the user rubs this ring, only he will see himself. He will appear as a black shadow to himself when he is invisible. The ring has one flaw. Every time the user steps, he takes a very slight chance of the spell wearing off. He will be seen after 16 steps for sure, but maybe sooner. No other magic device will work for the user while he is in this state. If he rubs the ring again before he has become visible again, it will make him visible.

Discarding the ring will shut it off. Note that the ring can be passed around to make a whole group invisible. Note also that if the user does this, he might not get his ring back.

5.2.4.5. Cave Finders

There are little black jewels that aren't worth much, but if you hold them in your hand and step on a cave, they will shine white.

5.2.4.6. Jinnis

Jinnis are associated with magic articles like rings and lamps. When these articles are rubbed, the Jinni will appear in an adjoining cell. If there is no adjoining cell, then the Jinni will not appear. When the user invokes a Jinni, it will automatically attack whomever last attacked the user. The record of who last attacked the user is erased every time the user moves to a new room. Releasing a Jinni before being attacked can act as a threat, so the user will not be attacked. The Jinni will remain free until the user rubs the article associated with it again.

There are many different Jinnis. The color of the Jinni determines what Jinni it is from. The colors determine a hierarchy. The priority of the colors should be counter intuitive, to make it harder to figure

out. The colors available are blue, red, green, yellow, aqua, turquoise, orange and purple.

It is possible that two Jinnis can be sent to attack each other. The Jinni of the higher order Jinn has a better chance of surviving. The greater the difference in priority, the greater the chance of success.

Jinnis are not invincible. They can be killed. Different color Jinnis are more effective against different things. Each color of Jinni has a fatal weakness. The higher the priority of the Jinni, the more idiotic is the achilles heel. These weaknesses will not be publicised at all. People will have to learn them by trial and error.

For example, the lowest level of Jinni will not leave the room it was invoked in. If that level of Jinni attacks, just run out of the room. The highest level of Jinni will attack with whatever weapon its target is holding in its hand. If that Jinni is attacking a user, just move your hand to an empty cell in the inventory room. Then the Jinni will only be able to push you.

Jinnis can also be ridden. The level of hierarchy will determine how many things the user can carry while riding the Jinni. The lowest level Jinni can not carry a user if the user is carrying anything.

5.2.4.7. Transformations

There will be some articles that when rubbed, will turn the user into that kind of entity. When a user is transformed into another shape, such as an eagle or lion, he is automatically forced out of his inventory room. The user will remain in that shape until he looks into his inventory room, which ends the spell. The articles that cause this to happen will be statues of the animals that the user will be transformed into. Not all statues work, and some only work sometimes. (So be careful what you buy).

5.2.4.8. Magic Doors

There are some doors that operate like caves in that they do not open unless the user says a magic word. The magic word is fixed, and can not be changed. These doors may appear as average doors, or they may just blend into the background perfectly. On all magic doors, whispering does not work. The user must "say" the word.

5.2.4.9. Magic Locks

Magic locks are like normal locks. In fact, you can't tell them apart. But magic locks will open two different ways. You can open it with a key, or with the magic word.

Some locks may be sticky, so the user may have to say it a few times to get it to open. Shouting the word at the lock will always work. The user must be standing on the lock to open it.

Note that this can be used to leave hooks for future additions.

5.2.5 Information Feature Set

The Arabian Night stories are filled with poetic verse that the characters in the stories quote when they frequently reflect on their fate. This mechanism can be copied into the game in the form of hints that help the user play the game more expertly. It can also set the mood of the adventure, by using imagery and emotion in verse.

Not all information sources are alike. Some give more helpful information than others. Every dynamic information outlet will occasionally refer to an outlet that will give better information, to intrigue the user and send him off to find it.

5.2.5.1 Scrolls and Writings

Users may come upon scrolls and etched messages on walls that will help them play the game. Scrolls can be picked up and carried, but they can not be read in the inventory room. To read a scroll or a writing, place the user icon over the object and type "?" followed by ENTER. The screen will temporarily show the text of the message, long enough for even the slowest reader to read it. Objects may also have inscriptions, like "Slave of the Lamp", "Rub me" or "Made in Cairo".

There should be the facility to allow users to write on scrolls also. Blank scrolls can be purchased at the bazaar, or perhaps found on the ground. A specific command like "w" could mean write. The text following the "w" command would be inserted onto the scroll. The same restrictions apply as when talking, only 40 characters maximum. For ease of implementation, the scroll can only hold one line of text. User scrolls will have to be dynamic like caves. After 7 days, a scroll not in a cave should dissolve and go away.

5.2.5.2 Taverns and Bazaars

Taverns are good places to learn things. Users will go there to teleconference. A user might over hear things that interest him. Not all the patrons in the tavern are real users. There will always be a few drunken patrons who will tell things they probably shouldn't. But fights also occur, and it's every man for himself. (Remember the bar scene from Star Wars !!)

Each palace has a bazaar that is always open for business. At the bazaar, the user can go to established shops and barter. Established shops are run by the computer in reality, and they actually fabricate things to trade. Users can trade between each other, also.

Jewels are scattered all over the world, but particularly in the desert. All trade is done by bartering. But the jewels do have a hierarchy of worth. Jewels appear as diamond shaped objects. There are three sizes. They also come in three colors: purple, red, and yellow. Purple jewels are worth more than red or yellow. Red is worth more than yellow. Sometimes smaller jewels are embedded inside bigger ones, which makes them worth even more. The most costly jewel is a big purple jewel that has a red medium size and a small yellow center.

The bazaar traders will fluctuate the price of items from time to time. Each purchasable item will be lined up at the top row of the shop. Underneath it will be a jewel that represents the asking price. (Note that it is possible to rob the shop keeper! If the shop is robbed, it is closed for the rest of the night.) If the robber is a user, his picture is posted in the Hall of Affairs in the palace.

If no jewel is present, it means that he wants the user to guess. (Don't offend the shop keeper by offering too low of a price. He may throw you out !!) Underneath the jewel is a bowl that acts as a scale. This is where the user puts his money down. If they have a lot of a certain item, it will be at a low price. (In reality, it means that the game has perceived that there is a shortage of those items, and so it is making it easy to get one. If there is an overabundance of a certain article, it will not be offered for sale at all.)

A user can dicker with the merchant. This is done by repeatedly offering a lower price for an object. This is done by repeatedly picking up a jewel and dropping it on a scale. The lower the price, the lower the odds it will be accepted. Too good a deal, the user may have to do this a lot. If the jewel disappears, then the desired object will appear in the user's inventory room.

Many patrons of the bazaar bustle through the streets all the time. They are not all real users, but they will get in the way when a user tries to make a straight course across the street. Most of these actors are beggars. The inner palace is a matrix of 5x5 rooms. The outer perimeter of these rooms are all bazaars. The game controlled actors in these bazaars seem to meander across the room from room edge to room edge, delineating a thoroughfare of traffic. They are like extras in a movie. The energy with which these actors move is determined by the time of day. They are most active between 7:00pm to 10:00pm.

Beggars are dressed in grey. They are scattered all over the palace, but are the most dense at the bazaar and tavern. The user will occasionally hear their cries of "Alms for the poor". To give a beggar an alms, just drop it on the floor. He will scramble to pick it up, once the user steps back from it. If a user gives the beggar something, he may learn a rumor or two disguised in a blessing the beggar leaves on

the user's head. The more the user gives, the higher the probability that it will be good information. The more he gives, the higher the probability that more beggars will flock around him. Their yelling for more money drowns out any possible communication.

Beggars are attracted to users depending on their "comfort" index. Beggars normally stick to the corners of the room they are in and are attracted towards the center of the room if real users enter. The comfort index is a count of how many steps away from the user they would like to be. If the user is holding a weapon, the comfort index is higher.

Beggars which are seated are story tellers. They will have a collection bowl in front of them. They have one essential difference from all the other beggars. They tell half of a story in advance for free, but pause just before the punch line and wait for someone to pay them to finish. Their information is always good. The user must step on their bowl to get them to start a story. Only the user who is standing on the bowl can hear the story. To pay them, just drop a jewel. It will disappear when it hits the bowl. If it is not enough, the story teller will just say "not enough" with humble eyes turned earthward.

Don't hit beggars! It will start a riot, and the user might lose everything he possesses.

Some beggars are thieves, so be careful. If a beggar stands too close, he may have taken one of your possessions. But he will not take the possession your hand is on. The user is not warned that it has happened, so be aware.

5.2.5.3. The Magic Wall

In one special room is a wall that has etched lettering on it. But the message changes magically, once a day, sometime during the prime time hours. The message will give clues on how to play the game.

5.2.5.4. The Magic Voice

In yet another room, there is a mystic voice that speaks once a day, but always at the exact same time of day. Since this message is very temporary, very special clues are revealed this way.

5.2.5.5. The Magic Scroll(s)

There is a magic scroll which changes it's message from time to time, on the average once a day, but occasionally multiple times in one day. These also tell information about the game, but it is not as helpful as the wall or voice. (The filter for the scroll is not as strict as the wall or the Voice). All magic scrolls display the same message.

5.2.5.6. The Guru

High in the mountains, behind the rebel lines, there is a wiseman in a dark cave. It is difficult to find, and there are many perils along the way. Once the user finds the cave, he can not enter if he is carrying anything.

Guru never moves, and has no objects in the cave but a red pillow placed before him. As the user enters the room, the guru will invite the user to sit and learn wisdom. Then he will be silent until the user moves his icon over the pillow. If the user speaks, he will be invited to sit down, in a friendly but more stern way. If the user waits too long to sit and causes too much disturbance, the guru will not speak again unless you exit and re-enter the cave. Touching the guru will invoke a curse upon you.

Once the user is seated at the pillow and is silent, the guru will begin to reveal the secrets of the game. He will randomly pull out information in poetic verse. There will be a respectful pause between each couplet thus delivered. Each couplet will have a 5 second pause. The information delivered will range from deeply revealing to irrelevant. If the user speaks or does anything, he will be chastised to keep silent. Everytime this happens, the Guru will wait 10 seconds before he will speak again.

The very first thing the guru will tell the user is how to avoid the pitfalls the plagued him on the way to the cave. This will be kind of an initiation in an attempt to make the user feel humble, because the solutions to the perils will be logical and spiritual in nature. The perils should be designed so that they will trap almost everyone and yet when the user hears how to avoid them, he will say "How could I have been so dumb?".

For example, on the way to the Guru's cave, the user encounters a room with two paths across it. One path is straight, the other is crooked and tedious to maneuver. Both paths start and end at the same place on the top and bottom of the screen. But to the right of the straight path is an eagle's nest, which will force the user to walk right

passed it. If the user takes this path, the eagle will attack him, and it will probably take him longer to take the straight path. But of course, most people will probably chance it because the eagle won't appear on screen until the user is close to the nest.

5.2.5.7. Town Crier

The Town Crier walks around the Palaces and shouts announcements. He doesn't shout too often, so that he doesn't get in the way of normal game play. He is supplied mostly for dramatical effect, and to ensure that inexperienced players learn what they need to learn.

Striking the Town Crier is worthy of death. It is considered as if he was the Caliph, since he represents the Caliph.

5.2.5.8. Hall of Announcements

Inside each palace, there should be a room called the Hall of Announcements where users can leave scrolls meant for everybody to read. The game could provide messages also about the current state of the game or coming attractions. The top row of scrolls, with blue pegs, are official announcements posted by the Caliph. The text of these messages are what the Town Crier talks about. Users can also post notices in this room.

When a scroll is dropped in this room, it can no longer be picked up or written over. It will remain for one day only, unless the user drops a jewel on it. The jewel disappears, but it will increment the lifetime counter for the scroll, so that the message will remain posted longer before it is recycled.

5.2.6. Background Feature Set

The two palaces and the rebels set the stage for a global dramatical theme. The Caliphs of the two palaces occasionally make policy announcements. These announcements may be reactions to happenings in the game, or they could just happen by themselves. The announcements are about how they feel about the other two realms. There are four types of announcements that the first Caliph could make:

```

+-----+-----+
| CALIPH 2 | REBELS |
+-----+-----+
|  friend  | friend  |
+-----+-----+
|  enemy   | friend  |
+-----+-----+
|  friend  | enemy   |
+-----+-----+
|  enemy   | enemy   |
+-----+-----+

```

When one group makes an announcement, the other two groups will do so shortly thereafter to avoid idiosyncracies. (So that if Caliph 1 declares Caliph 2 an enemy, Caliph 2 will not still think Caliph 1 is a friend). It will always end up that two are against one, all three are friends or all three are enemies. The announcements are made by town criers that walk through the palace yelling the announcement. (Be sure to look for imposters !!) If the user is in the desert, he may not hear of the recent change in political environment.

Each user will carry with him a status bit that will declare his status with respect to each of the three groups. The user has no way of setting those bits directly. They are set by doing transactions with each group. One can not be neutral to a group. He is either friendly, or unfriendly to a group. (Binary is so convenient!).

These bits will cause patrols to pass by a user or be attracted to him. If a user is picked up, he may have to give a gift to the Caliph in order to get his bits proper. Some articles might be indications of alliance with these groups, for which a user might be jailed. Users may have to buy the right to pass through a realms territory unhassled by the police.

To accentuate the difference, horses are predominant in the northern kingdom, and camels are the main form of locomotion in the south. Hopefully, this will cause users to make rude accusations about camel jockeys and road apples.

5.2.7. Drama Feature Set

The game will provide scenarios that will give the user something to do other than just wander around the rooms and find treasures. The goal of the game can not be character improvement, because only a limited number of users will be given privileges of disk storage. Our system has the potential for 1000's of game players. The game has to be designed so that the majority of those users utilize little or no disk storage.

The game must support an audience which can come and go as they please. It shouldn't provide a small set of canned experiences that the user passes through. The game should not resemble a puzzle. It should be more like a TV serial, where the Background is always the same but there is a different but simple plot every night. As the name implies, it should seem to have a thousand adventures all rolled into one game. Clearly, these can not be canned. There has to be dramatic pieces which can be placed together in combinations, multiplexing the possibilities.

These pieces can be timed stamped when used, so that when a new plot is needed, the oldest used plot is recycled. An entry is made in the audit file when a new plot is initiated. This will allow designers to figure out which plots casues more users to want to play. A plot scenario may take a few days to be resolved.

Each scenario can take on one of two flavors: it can be generally addressed, or specifically targeted for a particular individual. For example, suppose a Caliph's child was kidnapped. He could send the town crier to announce who took her and how much reward is offered. Or he could summon a specific player to have an audience with him by way of a messenger, and then ask a specific player to go get her for a promised award. The latter case could be made believable by having the Caliph explain that if it were general knowledge that she was gone, something serious would happen, so he was trying to be discreet.

In reality, there could be many messengers all doing the same thing to a lot of players. The user could ignore the request of the messenger. But everyone who swallowed the ploy would be told the same story, except that each one would be told that the child was in a different place. It wouldn't matter to the game. The game would just place a child somewhere in the boonies while the interview was taking place. It wouldn't even matter if a user brought back the wrong one. The Caliph will exchange one child for one prize.

The successful completion of a mission could win a title. A hero would be given a name like Kamar al Kazan. (See Appendix B) The users will probably make up their own names, but this name will be

different. When the user desires to leave the game, he presents himself to the Caliph and request to leave by invoking his "hero" name. The Caliph will then store his belongings on disk as well as his state variables. When the user returns to the game, he goes back to the Caliph and states who he is. The Caliph then gives him his belongings back and "re-instates" him. The interview with the Caliph is absolutely private, so no one can ever learn the user's "Hero" name. (So don't go blabbing it all over). It is a more secure form of storage than the caves. The Caliph will not tolerate imposters. (Don't spell your name wrong, or you are dead meat).

When a hero title is bestowed, he is given a time stamp. Then, if a hero does another good deed worthy of a title, his name is not changed, but his time stamp is updated. A Caliph can only have a finite number of heroes. If all the Caliph's hero slots have been assigned, then any new heroes will oust the oldest hero on the list. This will require heroes to frequently do good deeds, and pits them against one another for favors from the Caliph. This was designed to reward the frequent player of the game who plays every night.

If a hero has been ousted by a newly bestowed hero, he will be surprised next time he goes to the Caliph for his belongings. When the retired hero states his name, the Caliph will say "Who?" and then walk out of the room. From then on, if the user tries that name again, he will be killed as an imposter.

Heroes can only save their state if they checkin to the Caliph just before they exit the game. If they die during a game session, it is good bye hero status. They have to earn it again.

Some users might get the idea that if they scramble up a few first and last names, they might stumble onto a heroes fortune at the expense of a stupid Caliph. Therefore, A Caliph will only grant a finite number of hero interviews a day. The number will be different each day, and will range between 8 and 20, depending on the Caliph's mood.

The Caliph has an Hall of interviews that only one user can enter at a time. (In reality, there could be many users in this room, but they each have a separate instance of the room with their own private Caliph, so it looks like they are alone with the Caliph.) When a user first enters the room, the Caliph will declare a greeting. The user should not speak first. That is disrespectful, and the Caliph will call the guards to throw the user out. The user will not be able to get in to see the Caliph again that night. There will be a Lobby with a line waiting to see the Caliph. A servant will come in frequently and reiterate things you need to do to please the Caliph and clues about the Caliph's mood. The people in line will be computer controlled actors.

Upon entering the Hall of Audiences, the user finds himself in a very ornate room in the center of the left hand edge. The Caliph stands at the center of the right hand edge. A Rug marks the path between the user and the Caliph. Don't walk on the floor, you'll get in trouble. Two thirds of the way to the Caliph is a booth that the user must step in to. Then the Caliph will issue the user a greeting. The content of the greeting will announce the Caliph's mood.

If the user is a hero, and states his hero name, the Caliph will leave the room for a second and allow the user to say his "password" in private. Before leaving, the Caliph says: "You may cover thy nakedness" which is the equivalent to the "password:" prompt in Unix. The Hero is then reinstated and the Caliph returns. The interview begins again, except that a Caliph is always a little more cheerful for Heroes, and will attach a personal phrase to the end of the greeting like "my ffriend", etc.

There is the possibility of creating impossible scenarios. Someone will eventually succeed at any scenario, no matter how difficult it was made. To reward these brave soles, they could be given a hero time stamp that is sometime in the future, guaranteeing that they will remain on the hero list without having to do good deeds for a long time.

Heroes are inseverably connected with the Caliph that bestowed the name. If the neighboring Caliph is not friendly with the hero's Caliph, the hero better stay out of that neighbor's realm. Hopefully, this set up will create two opposing teams that are real jealous of each other.

If the user becomes a member of the rebels of the desert (The Simsim), He will recieve assignments from the rebel leader which will send him to cause trouble for the other Caliphs. (Things like raiding safaris, Stealing the Tease Camel, etc.) These dramatic opportunities will cause the Caliphs to send real users after the real rebels.

Examples of dramatical pieces:

- Rescuing a kidnapped child
- Retrieving stolen property
- Killing a villain or nemesis
- Delivering goods or people to destinations
- Wars
- Being declared a criminal
- Investigation of a mystery
- Being challenged to do something
- Being Accused of something
- Being caught up in a plot
- Assasination attempts

5.2.Z.1. Rescuing a kidnapped child

Children can be kidnapped by other realms, or by special arch villains. Not only can Caliphs have their daughters abducted, but merchants and paupers in the bazaar can also fall prey to this dastardly deed. If the user is a hero, or has a lot of wealth or weaponry, they may approach him with their plea.

5.2.Z.2. Delivering goods or people to destinations

This is simply the opposite of rescuing a daughter, except that the game will make sure that some rebels or villains will get in the user's way. They may even succeed in taking her from him. If the user gives up and walks away from the situation, he will be declared an enemy of the kingdom and a price will be put on his head (See being declared a criminal). In addition, the plot will transform into a rescue plot.

Note that real users may even take her from the first escort, so they can turn around and deliver her back to the Caliph for the reward of rescuing her. The Caliph will assume she was kidnapped if she doesn't arrive at the delivery point within a pre-declared time period. The scallowags should wait for the time period to end, because if they try to cash her in too early, they may lose their heads. The time period may not be absolutely fixed, there could be a grey zone in the which the Caliph may be less and less suspicious as time goes by.

5.2.Z.3. Retrieving stolen property

This is identical to rescuing a daughter, except that treasure can be cashed at bazaars or sold to rebels, so there is more motivation for real users to stop the carrier. This kind of information is leaked out in the taverns.

5.2.Z.4. Killing a villain or nemesis

The king could randomly offer a price for an artificial characters death. The user may have to carry the dead body to the Caliph as proof. This can also be used as motivation to get users to go get monsters. If a user goes and gets a monster unsolicited, he will receive much more than if he was asked to do it.

5.2.7.5. Being declared a criminal

Some users may be declared criminals by certain realms. In that case, the user may be pointed out to the real users if he is sneaking around the palace. (Look! Theres Mack the Knife, get him!) By the way, sometimes those accusations are false. Real users can also initiate false accusations, so Beware!

The game could also set a user up to be framed. Suppose a user found an article lying on the ground. He would probably pick it up. And then a patrol comes by and catches the user, and claims he stole the Caliph's Hookah. It's into the slammer for him. Maybe the Caliph will show mercy if you showed no resistance to arrest.

5.2.7.6. Wars

Caliph's could declare war upon each other or upon the rebels. This should happen infrequently, about once every two to four weeks. It will involve a lot of patrols from both sides to gather together in the same room somewhere in the desert. The patrols will have some self protection built into their intelligence, but there will be some clashes. It will be announced by town criers where it will take place every half hour for the 48 hours preceeding the war. Neither realm ever loses.

The users can get involved. Some users might just go in on their own for a free for all. But the Caliph's could enlist users to help. Users could be called in for interviews and made captains. They will not be able to turn down the position. When a user is made a captain, he will have 3 or 4 guards taggin along with him where ever he goes.

When the battle field is reached, the men assigned to the user will follow his lead. If the user is 2 steps to the enemy, each member in his patrol will try to match that, but will also try to stay close to his captain. So if the user runs, they will run, too. The algorithm will have some lag time in it, so the user will have to go first, after which the others will copy him. Each man in his patrol will have different amount of lag, so it won't look like they are shadows of the user.

The battle will only last at most one half hour. It will be recorded if any user was on the battle field at this time. If he hit any man on either Caliph's army, he will be declared an enemy. If he was made a captain, and hit one of his side, he will be sought out and killed as a traitor. If he never set foot on the battle field and he is a hero, he will be stripped of his title.

5.2.7.7. Investigation of a mystery

A scroll is found that tells of a mystery that sounds intriguing and has the promise of great wealth.

The Caliph calls a user to an interview and explains how all his safaris into the valley of mimrod never return. He asks the user to investigate, and offers him

A user overhears two drunkards in a tavern:

Wherebe the camels eye aburied,
upon the crescent dune...

A treasure far more than this palace,
guarded by the lions of the moon...

Shhh! The walls have ears...

5.2.7.8. Being caught up in a plot

The user is strolling down a palace street when suddenly a beautiful princess comes running by with three slaves chasing her. She comes to the user and pleads: "save me from them." If the user ignores her plea, she runs off to find another guinea pig. If the user fights them off, he will then learn that she is the Caliph's daughter and is running away because he has promised her to an old creep. She begs forgiveness because soon the Caliph's patrols will come and kill him. (Better head for the hills, Brother!) She pleads for the user to take her with him. (Actually, she'll stick to him like glue. He won't be able to get rid of her. But he better not harm her, or his fate will be worse)

Note that the Caliph could actually send another real user after the first player, claiming that she had been kidnapped. It is possible for this one to end with a happy ending with no one getting hurt, but it will take a lot of fast talking. The Caliph is programmed to forgive his daughter when she is returned. If she returns unharmed, nothing will happen to the user who first helped her.

Other possible instant plots are:

Stopping a fight where one person is obviously the bully
An onlooker pleads with you to stop them
A fight breaks out in a tavern, and the onlookers start betting
Who ever you bet on loses, and the losses are high...
A merchant yells "Stop Thief" and starts to chase an actor.
A merchant yells "Stop Theif" and starts to chase a user !!
A Wazir claims to be your long, lost uncle and offers to help you
A woman points at a user and shouts "That's the man!"
A drunkard in a tavern challenges a user to

5.2.7.2. Assasination Attempts

About twice a month, the Simsim will attempt to assassinate an unfriendly Caliph. The parameters that determine if an attempt will be made are: The number of people that are currently playing, how long ago from the last successful attempt, and how many current players are members of the Simsim. If the orchestrator of the game decides that an attempt is going to be made, it will assign a real user, who is a member of the Simsim, to do it. If there are no members of the Simsim, it will be done by a game agent.

If successful, the death of the Caliph will cause him to become a white jewel, that symbolizes the jewel in his turban. Returning this jewel to the Leader of the rebels will gain a handsome prize.

The death of a Caliph will cause a new Caliph to be chosen. This Caliph will be exactly like the old one, except that he will have a new name. There will be a list of Caliph names that the Caliphs will cycle through. A coronation will take place within an hour after the assassination. The first act of the new Caliph will be to go to war, either against the Simsim or the other Caliph.

The hero list may be adjusted also. Heroes had better give a gift to the new Caliph to ensure their place in the hierarchy. Heroes who attend the coronation will be at the top of the list. (Their times-tamps will be reset to the time of the coronation.) Heroes who attend the coronation will also be expected to be on the battle field that night.) The location and time of the battle will be announced at the coronation.

5.2.8. Roles Playing Feature Set

Even though there is not disk storage allotted for every player that has ever played the game, there is still the possibility of Role Playing. For example, suppose the common role is a thief. Every person, when they log into the game, will start as a thief. If they desire to become a merchant, they have to buy a liscense from the Caliph. Thus, they are transformed into a merchant looking like character while they possess the permit. When they leave the game, they hide their permit in a cave. When they return to the game later, they start as a thief, but quickly go to their cave to fetch their belongings. Upon picking up their liscense, they are transformed into a merchant.

This scenario can also hold true for soldiers in the Caliph's army, kind of like the National guard. You can apply for dog tags, but would have to pass a test to get them.

Other roles that fit the fantasy are Prince, Emir, Wazir and Caliph. A Emir is a wise man, and can influence the Caliph as well as command palace guards. Perhaps a player needs to demonstrate great learning to attain a diploma, like solving a mystery, etc. A Wazir is a magician. Thieves can become a Guard or a Merchant. Merchants can advance to a Emir. A Guard can advance to a Prince. A Prince can advance to a Caliph. A Emir can advance to a Caliph or a Wazir.

The dual ladders for roles was created to let women enjoy the fantasy even though they don't care for the fantasy of fighting that much. They can become adept at trickery and magic.

The physical differences bewtween roles would be more than just different icons and the ability to attack different kinds of monsters.

Thieves would appear as short fat figures. They would be considered unclean. They could be smelled by lions and monsters more easily, and are always eaten first. There are some places that only they can fit through. They have a much larger inventory room than other roles. They stumble onto riches much more easily. They are not too strong. They are pretty good locksmiths, too. There are special taverns where only thieves can go, and special rumors are only leaked there. Thieves can only trade their goods with user merchants and a few automated merchants on the bad side of the palace. Thieves are very good at hiding and looking. Beggars do not even waste their time asking for alms from thieves.

Thieves can pick pockets by pushing a user. This will cause a random selection of one of the user's objects to be transfered to the thief. If a user has his "hand" on the object, it can not be taken. There is

a random chance that the user will be told in a text message that it has taken place. The role of the player will affect the probability of being snitched on. Warriors are pretty easy to steal from. The probability that a merchant will be notified is determined by how much he is carrying. (The more the merchant is carrying, the less chance of getting caught).

Merchants are only one step better than thieves. They too can carry alot. But they do not attract monsters like thieves do. They can carry more than other roles, but thieves can carry the most. Merchants can travel and not get tired, walking does not weaken them. They are a little stronger than thieves. They can find riches easily too, but not as easily as thieves. Merchants always get the best price at the bazaars when they excahnge goods. Merchants are also great locksmiths, better than thieves. Merchants and Emirs can tell how deteriorated an object has become. Merchants are not very good at hiding or looking. Beggars like merchants, and will plague them relentlessly.

Warriors are very strong. They can't hide at all, and they don't "look" very intently. Warriors regain their strength very quickly. Warriors don't get tired when they travel. They can carry an average number of articles. They scare away weak creatures like apes or bats. Beggars are somewhat wary of warriors.

A Emir can become adept at the physical science of the game, but not quite magic. Emirs and Wazirs can heal people by pushing them. An Emir may have to "try" many times to restore a person to full health. A Wazir can restore full health with a single touch of his hand. (Note that a user can not push himself, so an Emir can not heal himself. This will cause kind of a brotherhood between them because they will need to travel in pairs.) They can more easily get rights from Caliphs to cross their land, negotiate deals, etc. Beggars are respectful of Emirs, but draw closer to them than they do to warriors.

Beggars are scared to death of Wazirs, and want to get as far away as possible from them. When a Wazir enters a bazaar or tavern, all the game actors scatter. A Wazir can overhear all whispers, and it is impossible to hide from the glance of his all seeing eye. To become a Wazir, you must be an Emir and pass a serious test. The test is to be found in the shifting sands. If succesful, you will recieve a wazir's hat. Rubbing the hat will turn you into a Wazir if you are an Emir. There are only a finite number of hats, so that wazir's are indicated by one color of clothing only.

If there is enough time, it is possible to allow users to become Caliphs. If Heroes attend coronations, there is a slight possibility that one of them will be chosen as Caliph. A user Caliph is represented by the town crier when he isn't in the Hall of Audiences.

The user Caliph has limited powers.

When normal Caliphs make decisions, they always leave the room for awhile, and then return with their verdict. They enter what is called the Chambers of Judgement. User Caliphs will do the same thing. In the case of a user Caliph, the chambers of judgement are a menu of choices that the user can choose between.

For example, If a new user has earned the right of being a hero, and the hero list is full he must delete the oldest hero out of the list. The user Caliph will be presented with the two oldest names in the list, and he can choose which one to delete.

Allowing the possibility for a user Caliph adds intrigue because it may cause factions among the heroes, assassinating each other to take a chance on being selected as the new Caliph.

5.3. Structure

5.3.1. Architecture

The project will be based on IPC and will communicate to the user entirely through NAPLPS frames.

There will be a variety of compile time directives that will be defined in the design document. These directives will control the creation of different versions of the game for the different stages of development and for testing.

5.3.2. Testing

In order to test the game process, there will need to be terminal drivers for the Sceptre Terminals and the Microtel Terminal. These drivers will pass information between the NAPLPS terminals and the HeadEnd Game Process. These drivers will use putchar statements to send NAPLPS frames to the terminal, after stripping off the IPC header. They will catch input from the terminal with getchar, place an IPC header on the input, and send it to the game process.

The drivers will recognize a special key sequence (~<ENTER>) that will mean disconnect from the NAPLPS processing. This will cause the driver to send a request to exit to the HE game process and restore the NAPLPS terminal to dumb terminal status.

Five queues will be needed for the testing, one for each of the three terminal drivers and one for each of the three HE processes. The queue numbers have already been assigned as 21 through 25.

The testing will be in multiple stages. The coding for all stages will be completely designed before any source code is generated for any stage. Changes in the design that are required due to the learning gained in each stage will be reflected in the documentation and design before the next stage is entered.

6. Design Tradeoffs

Many of the functions to be created for this game will exhibit a simple level of artificial intelligence. In the interest of time, the simplest workable solution will always be designed in each case. Once all the pieces are together, a fine tuning period should ensue before unit test in which the intelligence routines are beefed up. This polishing phase is common to game developement and is not found in any other software project evolution.

Some intelligence routines may be thrown out all together and replaced with new versions. What is to be created is a body which reacts to a pre defined interface stimulus. Then the brain is built last, like Frankenstein. Not much time should be spent in trying to build the ultimate intelligence routine because it is frequently found that simple ones usually are sufficient.

7. Performance

It is hoped to achieve a moderate pace where a user can type in a four character command sequence, observe the screen, and enter another four character sequence just as the commands are finished being implemented.

It is hoped that this pace can be maintained even if twenty six users are simultaneously playing.

A predetermined amount of disk space will be used, except in the case of an audit trail which can grow arbitrarily large. The audit will show when players enter the game and exit the game. The audit trail file will be viewable in an editor. Game rooms will reside on disk when no one is in them. Each room will use approximately 1K of disk storage.

8. Reliability

The standard mode of development at Packet Technologies will be used to ensure program correctness.

9. Maintainability

The code will be written using the Plum Hall Standards with the PacketCable addendum.

10. Appendix A - Character Sets

There is the underlying DRCS character set. On top of this will be built a meta character set which will determine color, reflections and combinations of DRCS characters.

DRCS characters:

0		
1	WAZIR	- a wazir's body
2	WAZROBE	- a wazir's robe
3	MERCHANT	- a merchant's body
4	MERROBE	- a merchant's robe
5	MERSASH	- a merchant's sash
6	UNLOCK	- a lock that is unlocked
7	TREETRUNK	-
8	TREETOP	-
9	THIEF	- a thief's body
10	THIROBE	- a thief's robe
11	THISASH	- a thief's sash
12	TENT	- a tent
13	TENTEDGE	- the fringe of the tent
14	STONE	-
15	SNAKE	-
16	SHIP	-
17	RESERVED	*****
18	SCROLL	- the paper of the scroll
19	SCROLLPEGS	- the ends of the rods of the scroll
20	RING	- a circular ring
21	RIDER	- a human figure riding
22	RIDROBE	- the robe of the rider
23	RIDSASH	- the sash of the rider
24	PRINCESS	- a female body
25	CESSROBE	- the robe of the princess
26	LOCK	- a locked lock, not LOCK to avoid system conflicts
27	PRINCE	- a prince's body
28	PRIROBE	- the prince's robe
29	PRISASH	- the prince's sash

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30 LION -
31 RESERVED *****
32 LAMP -
33 KEY -
34 JINNI - a Jinni's body
35 JINROBE - the Jinni's clothes
36 JEWEL1 - the smallest jewel
37 JEWEL2 - the middle jewel
38 JEWEL3 - the largest jewel
39 RESERVED *****

40 HORSE -
41 RESERVED *****
42 RESERVED *****
43 RESERVED *****
44 GURU - the guru's body
45 GURROBE - the guru's clothes
46 WARRIOR - the warrior body
47 WARROBE - the warrior's clothes
48 WARSASH - the warrior's sash
49 GIANTTOP - top half of the giant

50 GIANTBOT - bottom half of the giant
51 GIANTROBE - giant's clothes
52 GHOUL -
53 EMIR - an emir's body
54 EMIROBE - an Emir's clothes
55 EMISASH - an Emir's sash
56 EAGLE -
57 BEAK - the eagle's beak and claws
58 DRAGTOP - top half of the dragon
59 DRAGBOT - bottom half of the dragon

60 DOR - door, NOT DOOR to avoid symbol collision
61 CRYSTAL - the crystal ball
62 CRYSTAND - the base of the crystal ball
63 CRIER - the town crier's body
64 CRIROBE - the town crier's clothes
65 CIMITAR - a sword
66 DAGGER -
67 CARPET - a flying carpet
68 CARPEDGE - the fringe of the magic carpet
69 CALIPH - the Caliph's body

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70 CALROBE - the Caliph's clothes
71 CAMEL -
72 BOWL -
73 APE -
74 SEASHELL -
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META CHARACTERS:

0 - USER0
1 - USER1
2 - USER2

n - USERn

11. Appendix B - Names for Heroes

The names are to be assigned as passwords to obtain a users possessions upon first entering the game. The first and last names could all be in arrays, and stored as indexes into the arrays. Note that the middle name is always "al" or "bin". Heroes from the northern kingdom have the middle name "al". Heroes from the southern kingdom use "bin".

Kamar al Akmar
Harun al Rashid
Abi bin Kilabah
Ibn al Suman

Ma'an bin Zaidah
Zu al Kuraa
Kamar al Zaman
Abdul ? ?

Shahryar al Zaman
Sulayman ? ?
Sakhr al Jinni

12 Appendix C - List of Game Clues for the Embedded Manual.

Don't ride a camel that isn't yours
Don't bring a camel into a bazaar
Don't buy a camel right away, wait for the price to go down
It's easy to make money at the Friday Night Fights
The location of the magic wall
The location and time of the magic voice
The fact that there are crystal balls, and how to get them
The fact that it is possible to have an interview with the Caliph
Don't speak before the Caliph does
The Caliph gives gifts when he is in a good mood
The odds are three to one when the Caliph goes to the friday night fight
Give a tavern owner a gift to be safe, or act aggressive
Don't enter the bedroom of the Jinni
Don't awaken the Jinni

The location and worth of the guru's information
where to go to see the System Ids of all users
How to turn on the Pool of Ablution to see where everyone is
Camels are faster in the desert, Horses are faster on the ground
The fact that there are caves, and their default entry password
The fact that there are cave finders.
The fact that all cave passwords are unique
The fact that old caves are set back to the default entry password
The fact that the giant on Giant island will eat you
The fact that the prisoners on giant island tell great game clues
The fact that the only way to leave Rukh island is to ride the bird
The fact that the only way to land safely on Jeweled Island is to ride the bird
The fact that jewels are free to take on the jeweled island

The fact that Fish Island is actually a fish, so you should land there
The fact that Harem island is actually lure to lead you to a seaserpent
The fact that the only way out of the Cavernous island is by underground streets
The only way off the isle of the palace of 40 doors is ride the winged stallion
The fact that you should dismount your camel when you first enter new territory

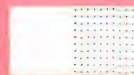
13 Appendix D - Overview of rooms in the Game and their connections

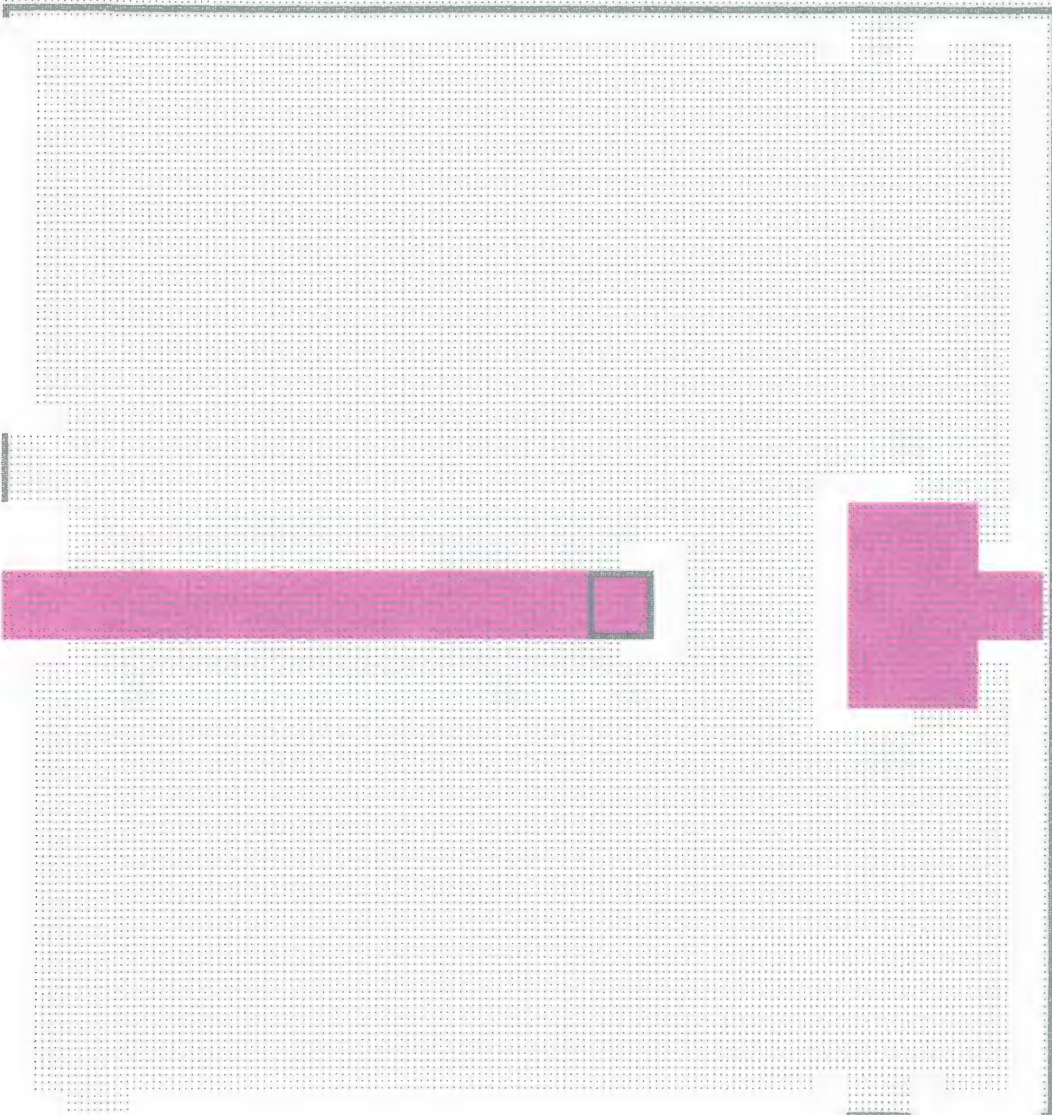
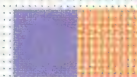
GLOBAL WRAP AROUND									
	mountain pass					coast	giant island	>>---	
					north palace	coast and pier	Palace Island	>>---	V
	goru cave			caves		coast	Jewel Island	>>V	V
B									
L	Simsim rebel camp		caves	pool of ablution	coast and pier		Rukh Island	Ichang of tide	
D				caves	coast		Fish Island	>>---	
C									
K									
E									
D									
	sleeping Jinni		south palace		coast and pier		Cavern Island	>>---	
	shifting sands					coast	Harem Island	>>---	
GLOBAL WRAP AROUND									

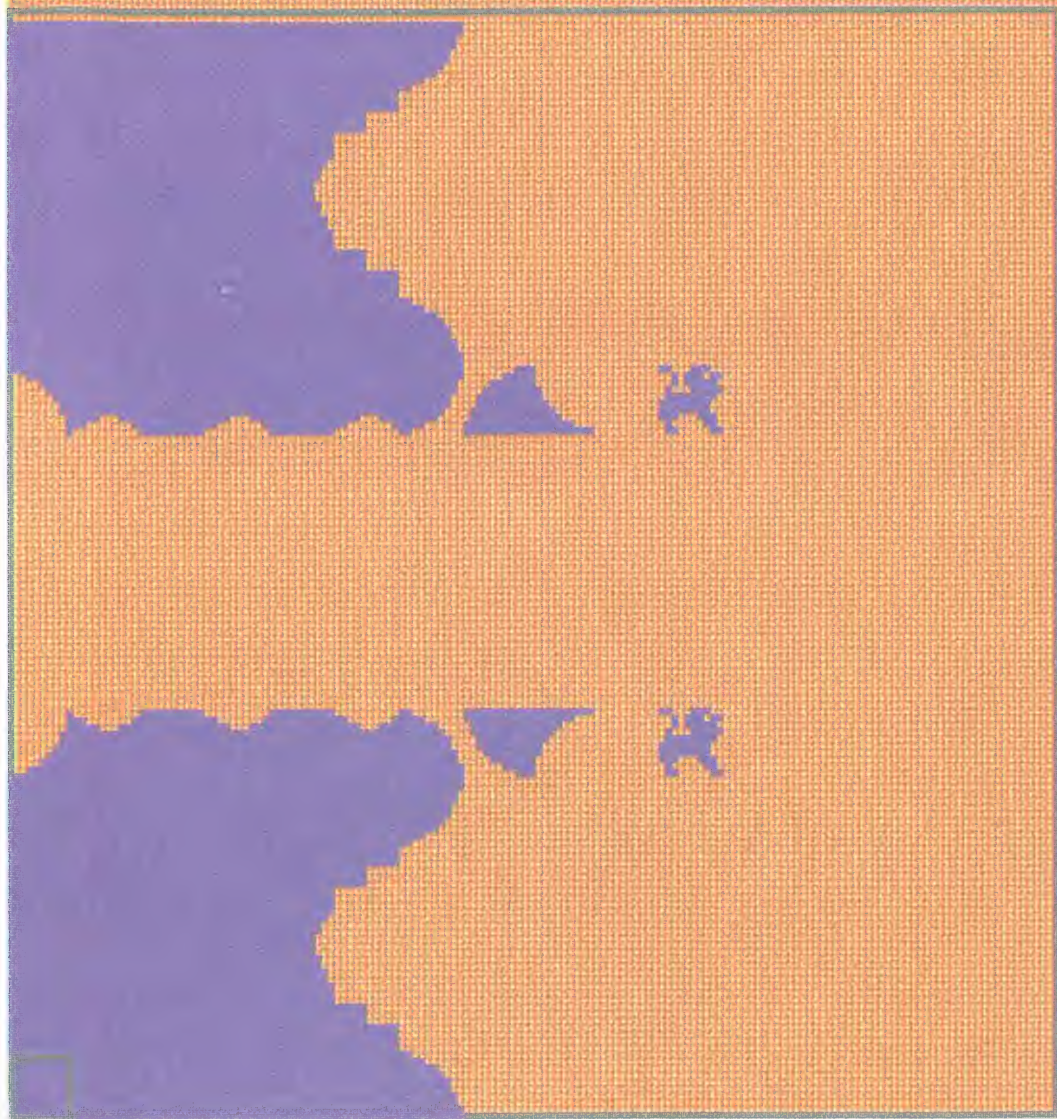
OUTER PALACE

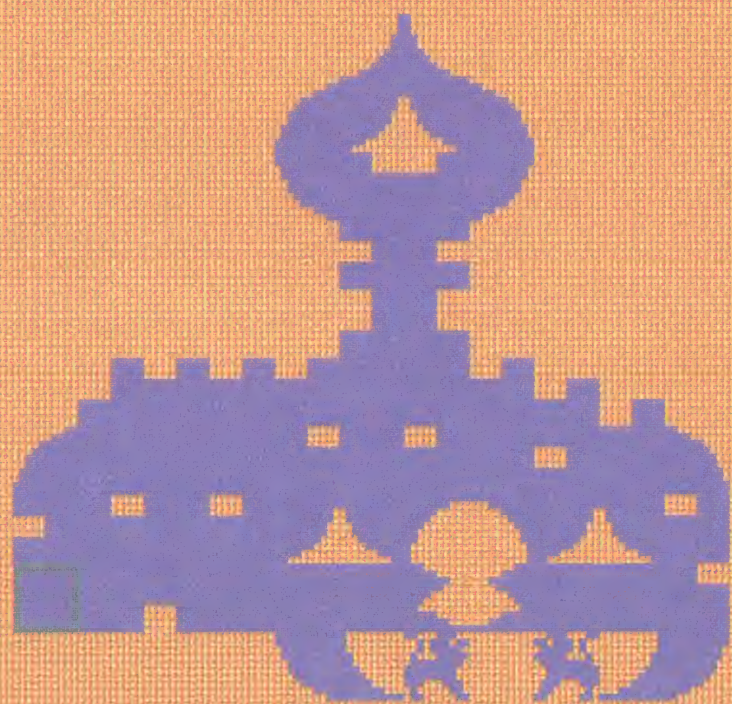
+	-----+	-----+	-----+			
	north		north		north	
	east		wall		west	
	corner				corner	
+	-----+	-----+	-----+			
	east gate				west gate	
	Tease				Tease	
	Camel				Camel	
+	-----+	-----+	-----+			
	south		south		south	
	west		wall		west	
	corner				corner	
+	-----+	-----+	-----+			

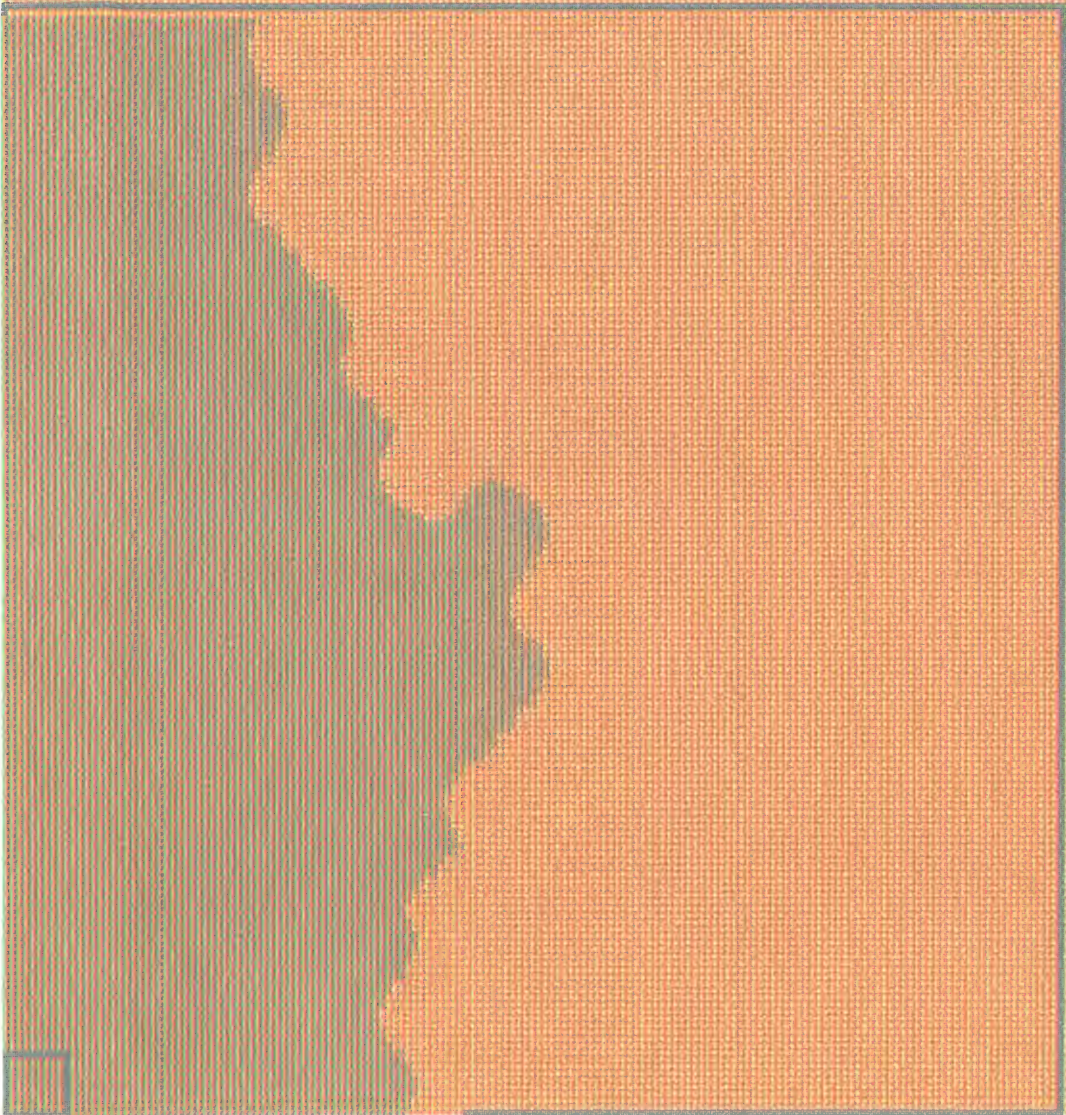
INNER PALACE					
	BAZAAR	BAZAAR	BAZAAR	BAZAAR	BAZAAR
	BAZAAR	HALL OF AFFAIRS	TREASURY	FRIDAY NIGHT FIGHTS	BAZAAR
WEST GATE	CAMEL/HORSE AUCTION	LOBBY	HALL OF AUDIENCES	JUDGEMENT CHAMBERS	CAMEL/HORSE AUCTION
	BAZAAR	HALL OF ANNOUNCES	HAREM	JAIL	BAZAAR
	BAZAAR	BAZAAR	BAZAAR	BAZAARR	BAZAAR

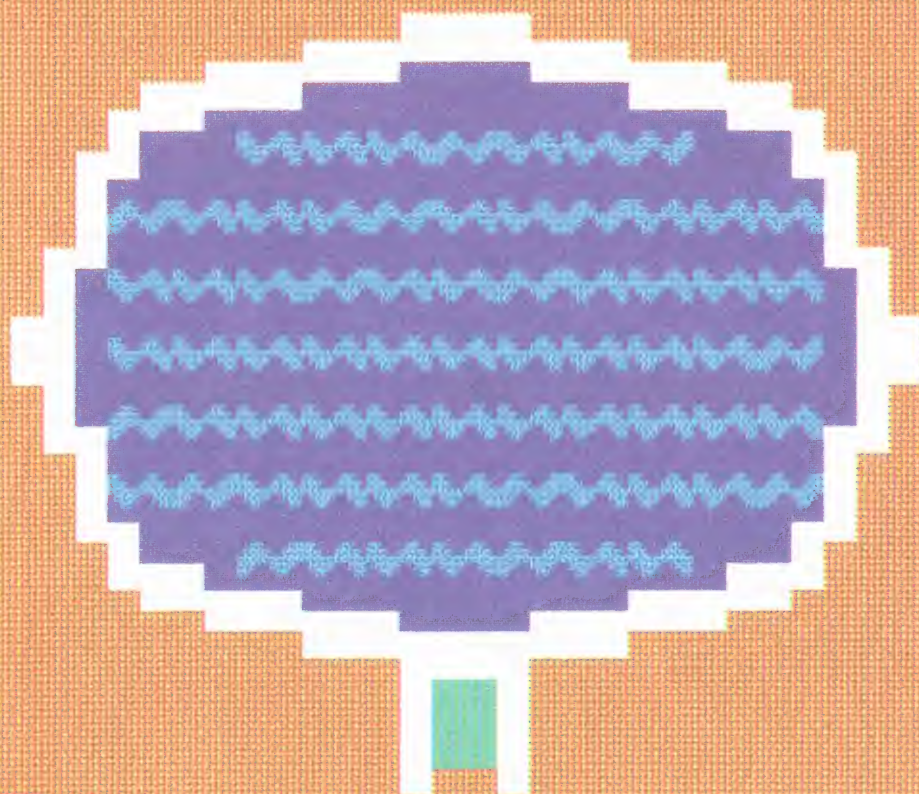


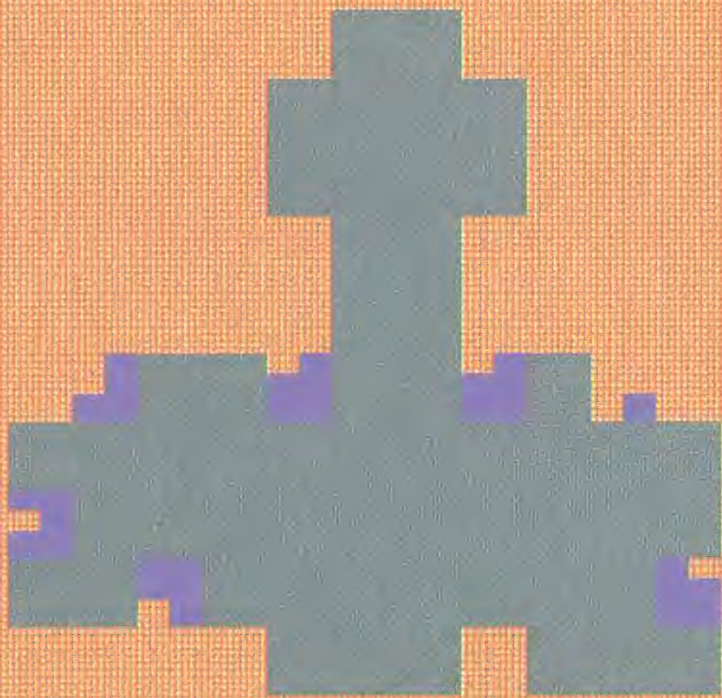


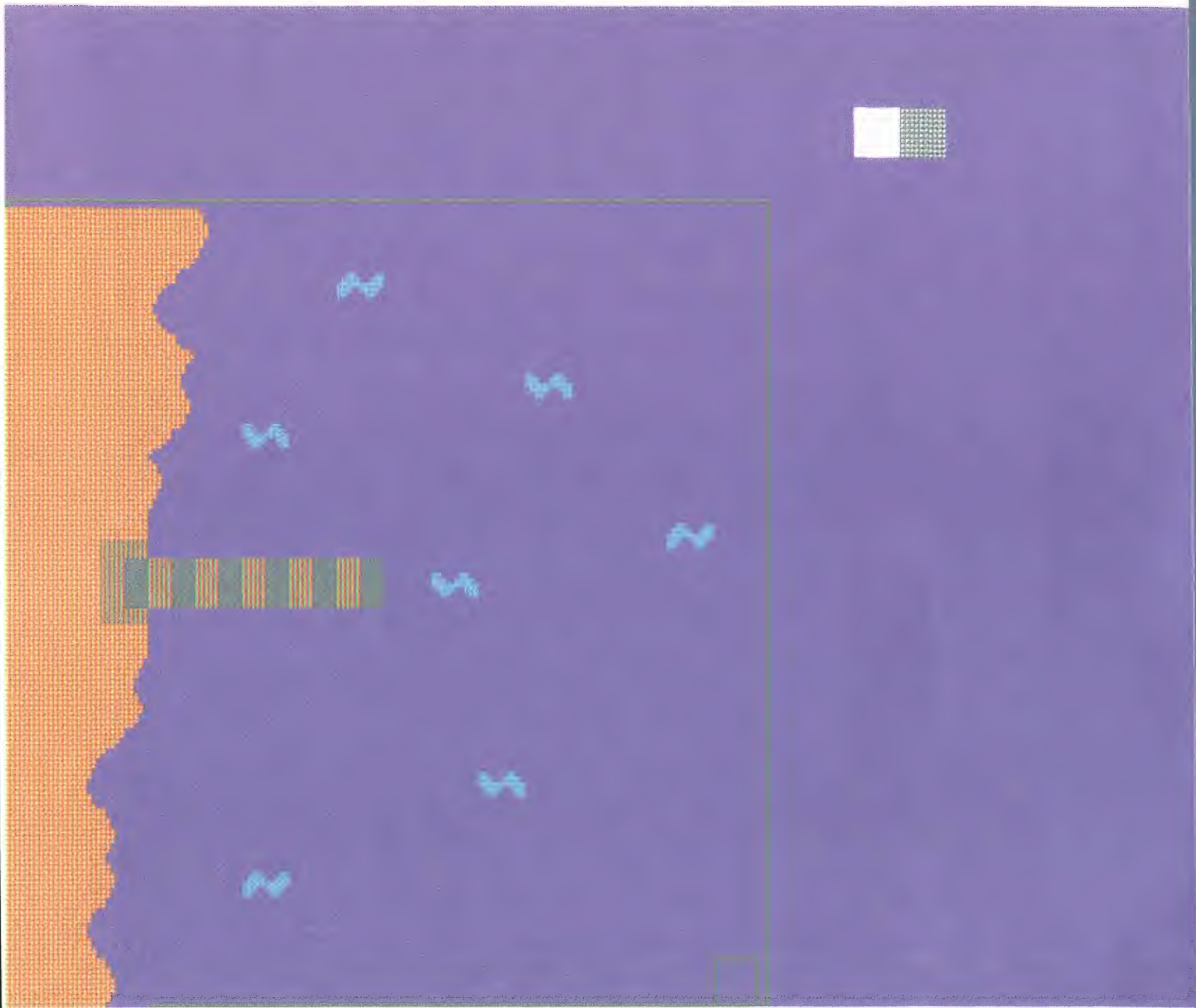


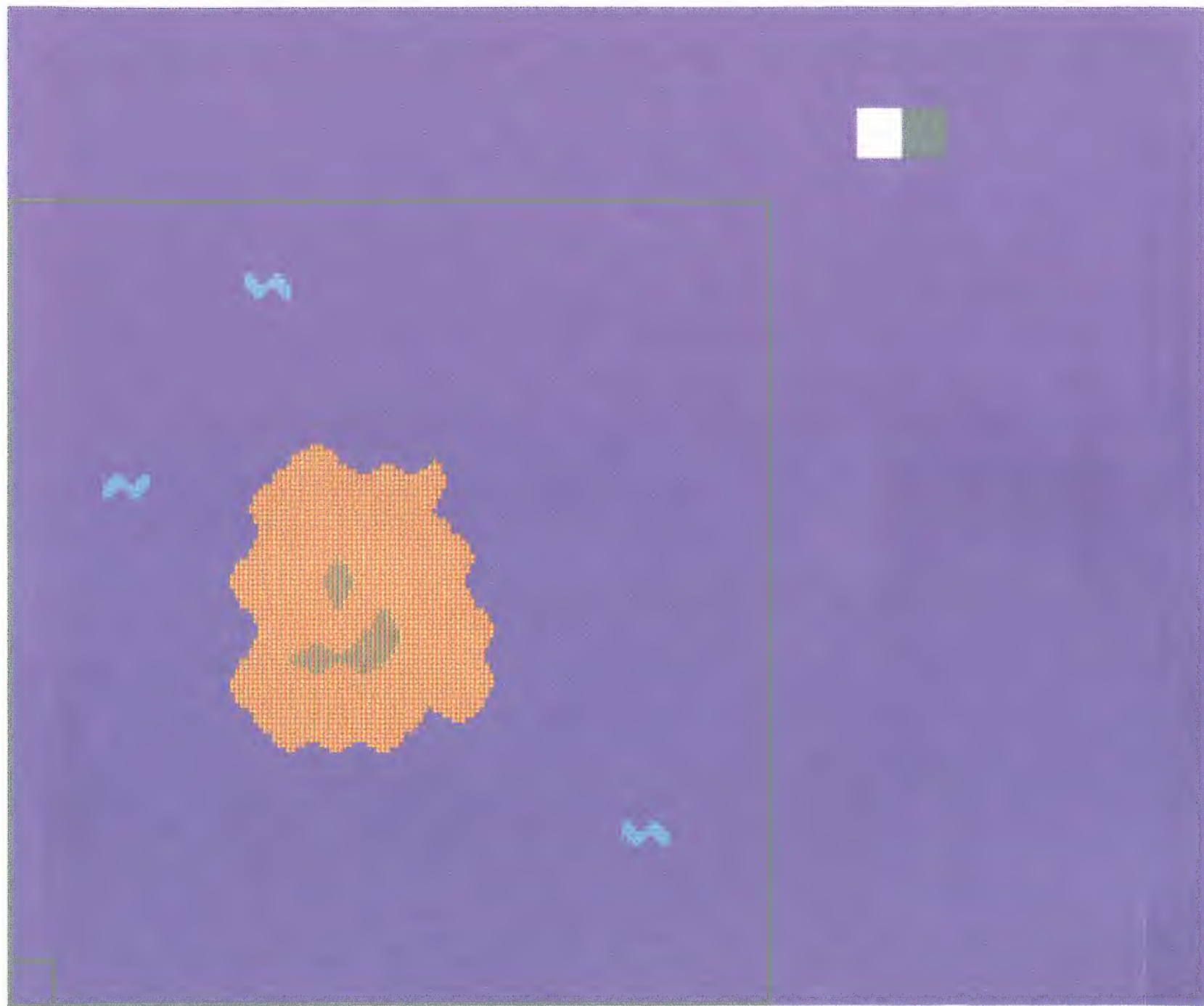


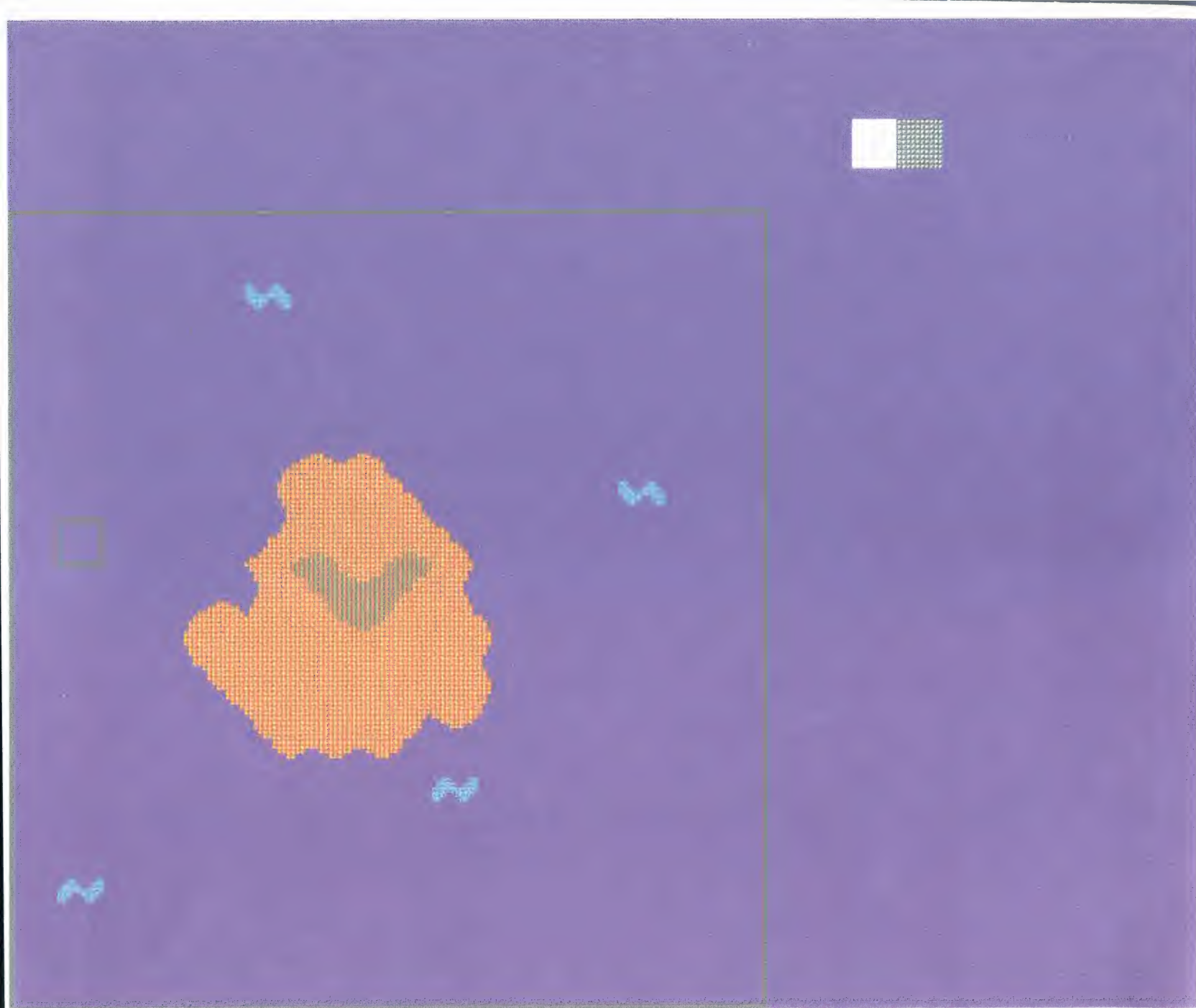






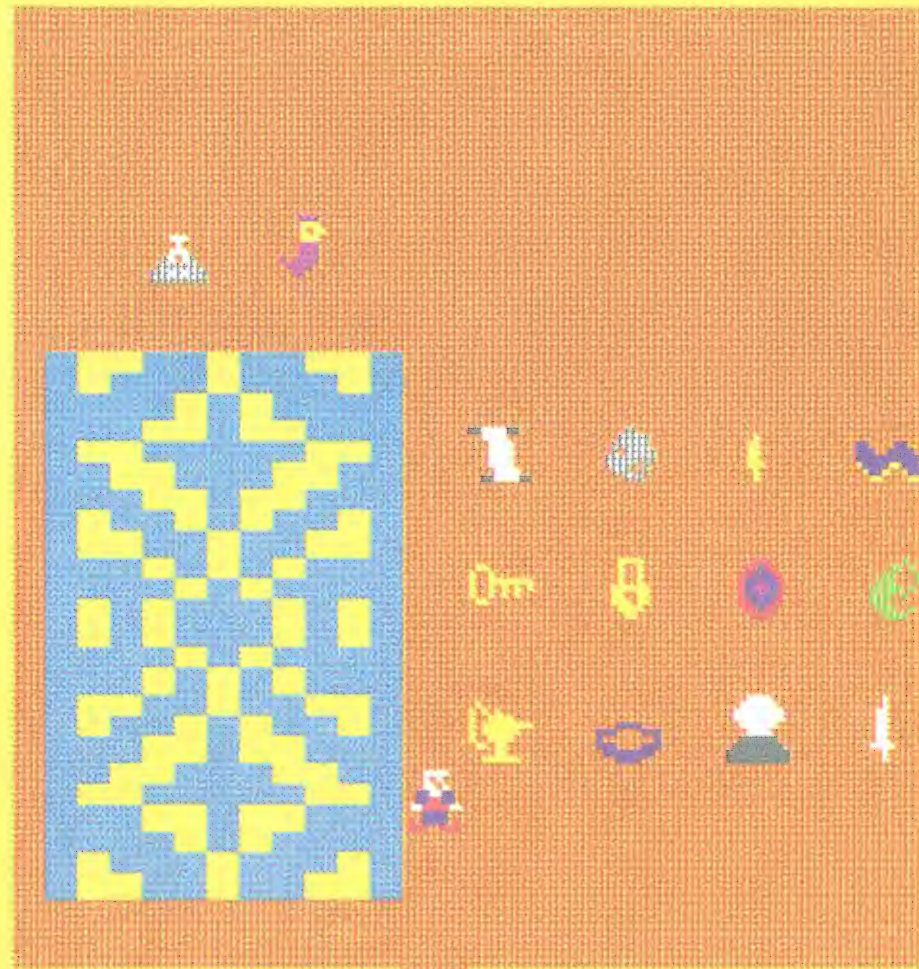






[[[.I'll step over the lamp.f
[.and then I'll pick it up!

--00000040
- up
- left
- right
- down
- exit
- pick
- drop
- show



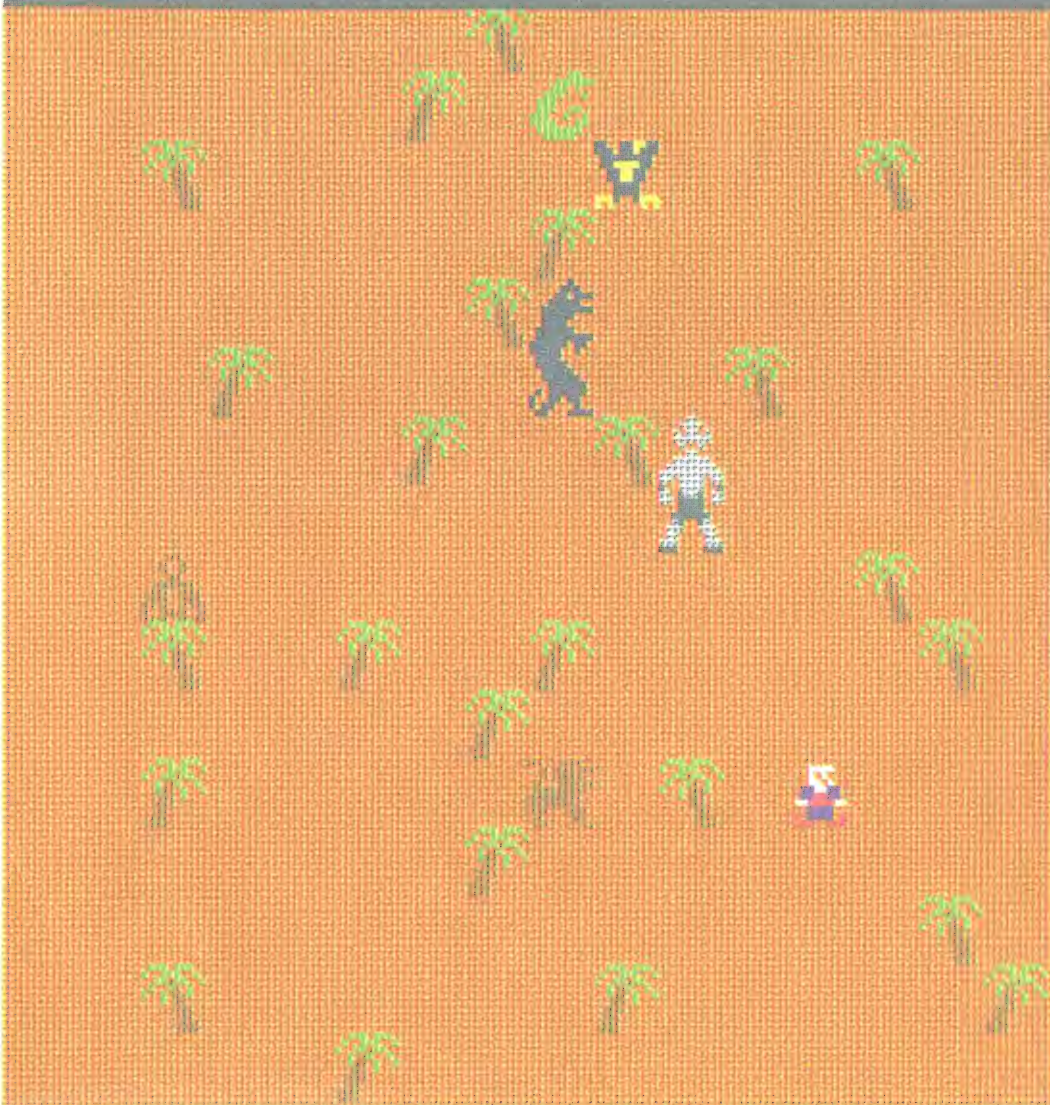
INVENTORY

4 - left
6 - right
0 - out

Om



RRRRRRRoar
HELP!
RRRRRRRoar



:-: 00040

- up
- left
- right
- down
- exit
- pick
- drop
- show



04500; LT:1

- up
- left
- right
- down
- exit
- pick
- drop
- show

